SOUTHERN Flight

June, 1944
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Vought engineers designed the Corsair as a better-than-400-m.p.h. gun platform. The result is a fighter of unusual stability, able to keep true on the target while unleashing the fire of six .50-caliber guns.

Superior take-off, climb, altitude, speed, range, fire power, all combine to make the Corsair an outstanding fighter.

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STRATFORD, CONNECTICUT
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

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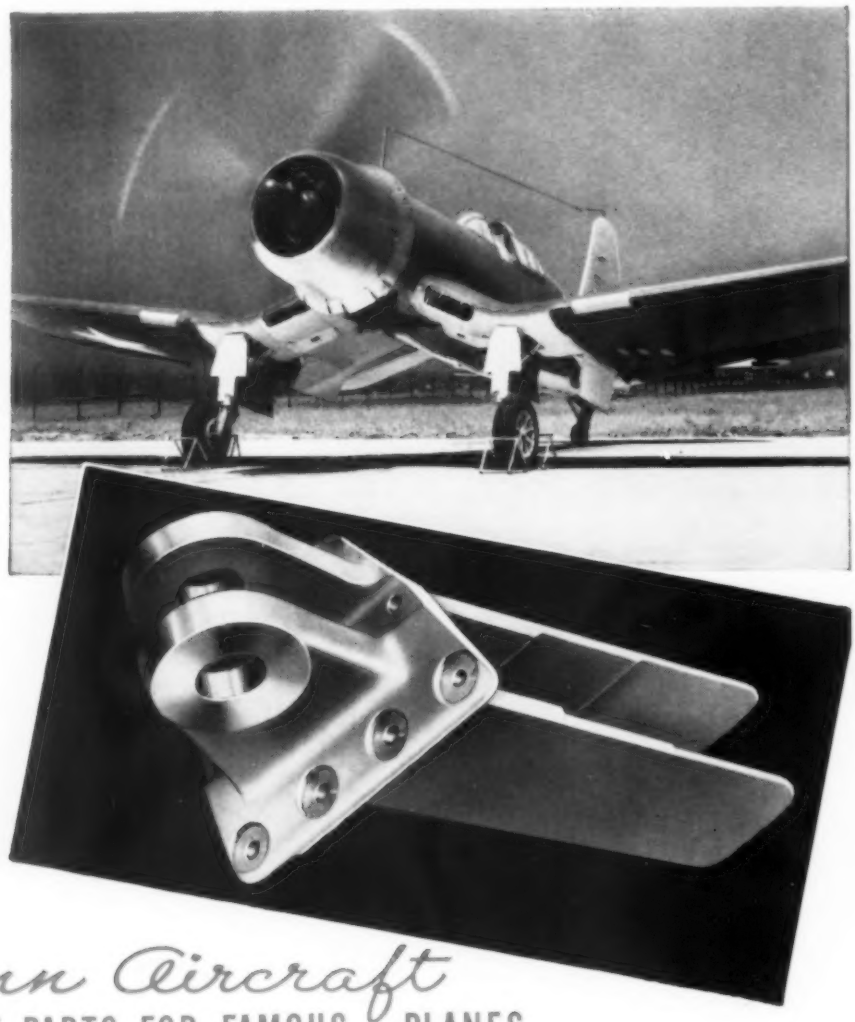
CORSAIR FG-1 *Built by Goodyear for the Navy*

This famous streamlined fighter has been battle-tested wherever American flyers are engaged. It has the qualities needed for a tough assignment any time — anywhere.



Fenn Aircraft

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Fenn Plants produce special parts and assemblies for Goodyear and other aircraft manufacturers to rigid specifications. The photograph shows a bulkhead fitting, machined from a solid aluminum forging.

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THE FENN MANUFACTURING CO.

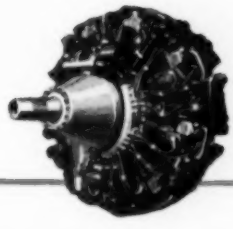
HARTFORD, CONNECTICUT

He covers the continent – *between editions*

In 6 hours and 58 minutes, less than the time between morning and afternoon editions, the TWA Lockheed *Constellation* spanned the continent. Commercial air transport, by this flight, reached scheduled speeds formerly possible only in military planes.

This TWA flight proved that such air travel will become routine, enabling passengers to cross from New York to Los Angeles between midnight and breakfast, with a full business day at each end. Planes like the *Constellation* assure true overnight service to foreign ports.

Four Wright Cyclone 18's of 2,200 horsepower each power the *Constellation*. Most powerful engines in service, Cyclone 18's were the choice of engineers and operators alike for reliability, fuel economy and the payload bonus on every flight which their lower unit weight provides. Such basic factors, plus the Cyclone's low maintenance cost, continue to demonstrate the axiom that *Wright Cyclones pay their way.*



Cyclones Save 3 Ways

LESS WEIGHT—MORE PAYLOAD
LOWER FUEL CONSUMPTION
REDUCED MAINTENANCE

WRIGHT

Aircraft Engines

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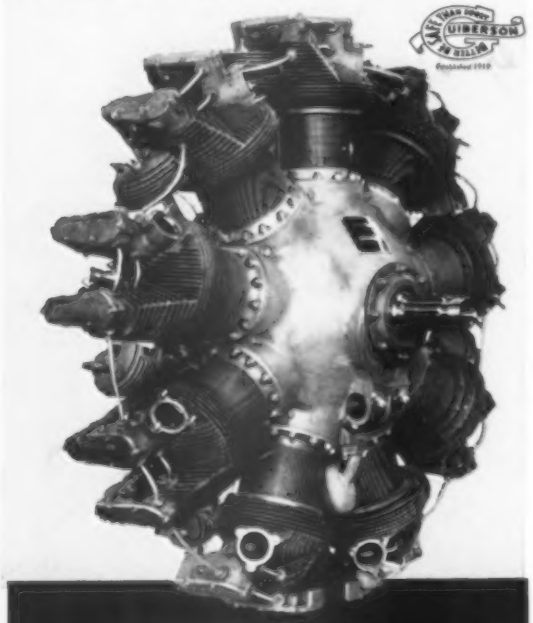
Using fuel that will not burn even when exposed to open flame, the Guiberson completely eliminates the usual fire hazard from the power plants of tanks, planes and ships, and there is no ignition system to cause sparks or interfere with radio operation. Weighing less than two pounds per horsepower, the new light weight Guiberson diesel hits harder, faster, farther. Safe and dependable, Guiberson powered equipment is hitting the Axis on the battle lines of the world and is ready to serve on land, sea and in the air.



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Dallas, Texas
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Aircraft and Heater Division

Southern Flight

Eleventh Year of Publication
and Faithful Service to the American Aviation Industry

JUNE, 1944 VOL. XXI, NO. 6

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GEORGE E. HADDAWAY, *President* R. T. GIDLEY, *Secretary-Treasurer*

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EDITOR: George E. Haddaway.
MANAGING EDITOR: Tom Ashley.
ASSOCIATE EDITORS: Bill Green, Esther H. Forbes, Jack Story.
BUSINESS STAFF: R. T. Gidley, Fred G. Wiggins, Ruth Keltner, Conard Baker, Jr. (In U. S. service with Seabees).
FIELD REPRESENTATIVE: Tony Hagmann.
N. Y. REP.: Harold Ives, Room 1011, 247 Park Ave., Tel. Eldorado 5-6589.
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THE FORMULA OUR ENEMIES FORGOT

Brainpower plus Manpower multiplied by Machinepower equal VICTORY. A simple American fighting formula that our enemies forgot!

Conforming to this formula, Doak Aircraft is a closely knit, hard-hitting manufacturing organization that is pouring vital aircraft parts and subassemblies into the cauldron of war. The resulting brew is sure poison for the Axis.

Come postwar and the same formula at Doak will be applied to peace. Brainpower plus Manpower multiplied by Machinepower can and must contribute to the abundance that will make the peace work.

So, after victory let's profit by our enemies' mistake and not forget the formula that makes our nation great.

DOAK AIRCRAFT COMPANY, INC.

TORRANCE, CALIFORNIA

WORKING AROUND THE CLOCK FOR A BRAVE NEW WORLD

The Birdmen's Perch

LAST MONTH we announced a new department.

We named it, with simple dignity, "The Little Known Facts About Well Known Planes Dept." And we invited contributions. We even offered commissions as Perch Pilot (bottom rung) for same. We're repeating all this just in case you got in late.

Meanwhile, until your mail gets here, we have to rely on Flutter, the Canary Commando, for Little Known F.A.W.K.P. To wit . . .

Now they're using Cubs on carriers! They carry mail, messages (from carrier to carrier on radio-silenced convoys), and even laundry . . . ship to shore and vice versa!

The B-26, once called "too hot to fly" (and a lot of other balderdash), has had probably the lowest casualty rate in the ETO—½ of 1%!

A B-17 has made recon photos of wartime Japan, so maybe it won't be long now . . .

Major Al Williams,

alias "Tattered Wing Tips," Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30 Pa.

LET'S GET DOWN TO EARTH...

Most of you instructors, mechanics, CA-People, etc. are doing work that really matters.

And practically all of you use cars getting to and from that work. So why don't you join Gulf's "Anti-Breakdown" Club, today?

The way you do that is to call your Gulf dealer and make an appointment to get *Gulf's Protective Maintenance Plan* . . . 15 services in all! This group of services includes lubrication, oil change, tire inspection (or recapping), air-filter cleaning, spark-plug cleaning, radiator flushing.

The Gulf Protective Maintenance Plan was conceived by automotive experts. Gulf developed it because car maintenance is our most important civilian job. And we're telling you about it because Perch readers are doing some of our most important war work.

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Here's what one company did:

They figured out a way to bond pure aluminum to steel. Then they bonded pure aluminum cooling fins (lightweight and excellent conductors of heat) and steel (for strength) cylinders. And now this particular company's 12-cylinder engine produces more horsepower per pound of weight than any comparable engine.

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They figured out a way to *break* the bond between a lubricating oil and those parts of it which quickly form carbon and sludge. Their method, which they called the Alchlor Process, makes it possible to get more of these carbon-makers and sludge-formers out of a lubricant. And now, this company's oil produces more lubrication per pound of oil than inferior lubricants.

This latter company: Gulf. The oil: Gulfpride!

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IF YOU'D LIKE TO "CARE FOR YOUR CARCASS FOR YOUR COUNTRY"...
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... MAKE DARN SURE YOUR GASOLINE TANK VENT OPENINGS ARE OPEN!
CHECK FREQUENTLY, ESPECIALLY AFTER PAINT OR DOPE JOBS. BETTER YET...
MEN AT WORK
CHECK EVERY TIME YOU GAS UP WITH THAT GOOD GULF AVIATION GASOLINE
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America's fighter pilots using Allison-powered planes are downing the enemy on every battle front. ★ Allison engines by superb performance have proved their ability to take punishment, their smoothness to lessen pilot fatigue, their economy to provide long range. ★ These engines — worthy weapons today — will contribute to the comfort and safety of the planes you will ride in tomorrow.

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P-38—Lightning
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More than 50,000 Allison engines have been built for the above planes of the U. S. Army Air Forces.

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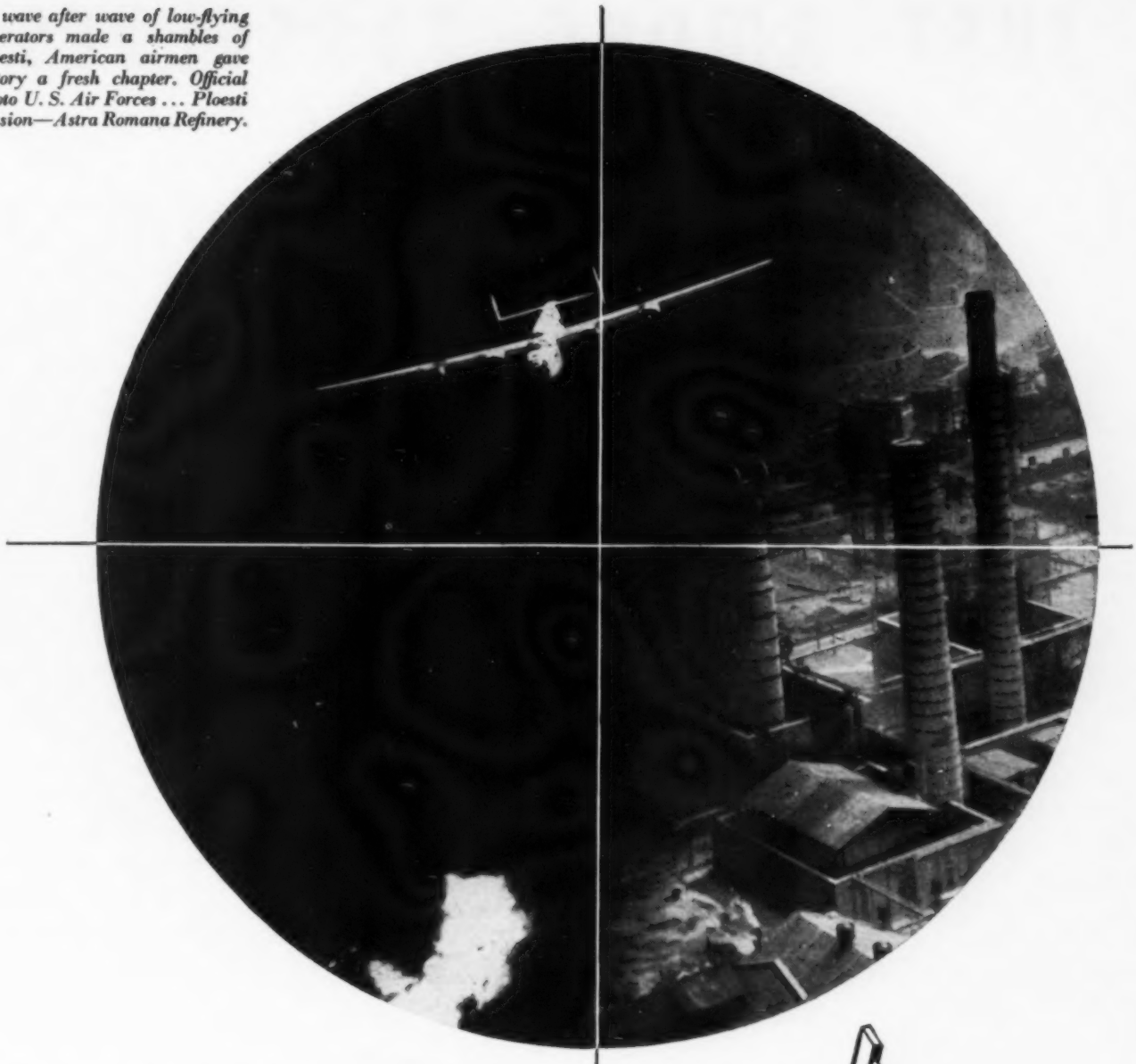
As wave after wave of low-flying Liberators made a shambles of Ploesti, American airmen gave history a fresh chapter. Official Photo U. S. Air Forces . . . Ploesti mission—Astra Romana Refinery.



. . . AT THE FUTURE "PLOESTIS"

EVERY red-blooded American hopes for many more headlines that shout "Mass Raid by American Liberators." Every solid punch these heavyweight fleets drop on enemy targets . . . every future "Ploesti" . . . is possible only through the courage and skill of the American kids that fly them, and the unceasing work of free American craftsmen who build them.

With millions of other war workers, the men and women of CECO look forward to each new record-smashing performance of the latest Liberators and other American warplanes equipped with CECO carburetors and fuel pumps.

CECO

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FUEL PUMPS
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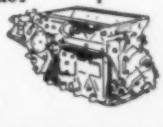

CHANDLER-EVANS CORPORATION SOUTH MERIDEN CONNECTICUT, U. S. A.

JUST AMONG OURSELVES

Editorials and Comment

Gasoline Rationing

IN Mid-May, the secretary of the Texas Private Fliers Association sent the following telegram to Chester Bowles, OPA Administrator:

"Urgently request official statement concerning possibility of rationing 73 and 80 octane aviation gasolines used in non-scheduled civil aviation. Has such rationing been definitely agreed upon and if so when will it go into effect? There are many aviation interests who have not had the opportunity to express themselves in opposition to rationing which they feel will kill highly important nonsubsidized flight training of American youth and close up many airports thereby killing aviation in small communities. Many of us in the Southwest would like to be heard before rationing is established. The airplane in this part of the country is an economic necessity contributing to the war effort. Please wire day letter collect a statement that may clarify the situation and relieve the fears of thousands of civilian airmen all over the nation."

Some days later the following answer was received under the signature of Bowles:

"This is to advise that present gasoline rationing regulations remain unchanged with reference to gasoline rations for private airplanes. No definite decisions have been made as yet regarding any modifications of the present program."

Augmenting the statement by Bowles is this excerpt from a letter by James L. Harrison, OPA Congressional Liaison Officer, in answer to a Texas congressman's inquiry:

"In view of the fact that all gasoline which is rationed is included in the PAW quotas within which the OPA must hold consumption, that there is a limitation placed on non-occupational use of gasoline in passenger cars and motor boats, and that occupational driving is severely curtailed, it would seem that there are very strong arguments for limiting unnecessary flying. While we have been discussing this matter with other government agencies and representatives of aviation associations, no decision has yet been reached as to the exact nature of the restriction. I can assure you, however, that there is no intention on the part of this Office to curtail the use of private planes performing any important function or to bring about a situation which would close airports or prevent the training of students."

The above information is current. That, as of June 1, was the situation as regards additional restrictions on 73 and 80 octane gasoline for private flying, all rumors, "inside dope" and predictions to the contrary notwithstanding. It's not settled; there's no fixed policy; and OPA bears watching.

We believe OPA is stirring up a tempest in a teapot. No doubt some aviation gasoline has been diverted into non-aviation use, but with "R" tickets now good only at bulk stations, this practice is virtually eliminated. As regards "unnecessary" flying, this type of operation should be defined and some estimate made of its scope. From our own observations most non-scheduled flying today is in the all-important fields of training and essential transportation. Passenger hopping and barnstorming is almost extinct. If "unnecessary" flying is defined and if non-scheduled aviation is called upon to curb it, there is every reason to believe that pilots, owners and operators will co-operate rather than face the time-consuming, unnecessary red-tape and the crippling regimentation OPA would like to dish out to them.

In view of the ridiculously small amount of gasoline involved, the fact that no one claims a shortage of 73 octane, and that not one government official or agency has produced any proof of extensive "unnecessary" flying, we cannot see one bit of logic or reason in the move now threatened.

After so many years of empirical bureaucracy perhaps we shouldn't expect any rhyme or reason out of the fair-haired boys in Washington, even in a case such as this where one of the nation's most vital and useful elements of wartime facilities is at stake. But every American airman, whether at home or on the battlefronts of the world, realizes full well the tragic consequences that would ensue if non-scheduled civil aviation should be knocked out for the duration. The fight must go on against those who in blind ignorance would strike the death knell to the little airports, the fixed-base operators, to non-subsidized flight training and to essential non-scheduled air transportation.

Gorrell Shows His Hand

Last month the Supreme Court ruled five to four that the State of Minnesota has the right to levy taxes on all airplanes belonging to Northwest Airlines, since the home office of the company is in that state. The case began when the airline computed its 1939 state personal property tax return on the basis of the number of airplanes *actually in the state* on tax day, May 1, 1939, while the state assessed the tax on *all* airplanes belonging to the company.

This Supreme Court decision is one of the most significant in recent aviation history, is certain to cause reverberations throughout the airline industry and should result in a complete, official inquiry into every phase of multiple taxation, which constitutes a definite threat to the healthy development of air transportation.

It is unfortunate that the Air Transport Association should seize upon this ruling to revive its ballyhoo campaign for the long dormant Lea Aviation Bill (HR 3420). But that's what happened last month, much to the chagrin of leaders throughout every branch of aviation who earnestly desire to see the industry unified by promulgating intelligent aviation legislation beneficial to all aviation interests, instead of proposals designed to look after the special interests of a selfish minority *at the expense and to the detriment of the majority,* as in the case of Lea's monstrosity.

The Air Transport Association seems to persist in the view that they alone should operate over the air lanes of this country; that they alone should have the privilege of making money out of aviation and that the rest of the industry be damned. By taking

(Continued on page 44)

Now that your WTS contract has been cancelled . . .

WHAT'S YOUR NEXT MOVE?

There's one smart move every aircraft parts dealer can make. That is, to get all the business there is — *right now!* . . . Here are a few helpful suggestions:

Offer and display prominently merchandise that is salable today — log books, computers, air navigation aids, aviation jewelry, license cases, etc.

Enlarge your acquaintance with people who are in the market for such items.

Through the appearance of your place of business, prove to your customers that you are in IN BUSINESS TO STAY.

Naturally, this isn't the complete answer to the problem of keeping income from sales and service at its recent peak . . . But — it's a way to get all set to make *plenty* of money when the war is over because:

It will go a long way in helping to "keep the doors open" now, and . . .

It will lay the foundation for your future prosperity in the aircraft industry, which is bound to boom when peace is here again.

Send for a copy of our Specialty Catalog of Aircraft Supplies. It will be a working help. And — you will want to know more about a company that will protect you in years to come, as in the past.

41

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during the past twelve years, working to exacting precision standards has contributed many instruments and services in World-Wide use . . . experience that today is enabling us to contribute our share toward Victory, building aviation and other military equipment, ranging from landing gear shock strut assemblies to pressure reducer valves for automatic pilots and electrical detecting and measuring instruments.

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EQUIPMENT IN WORLD-WIDE USE

Preview of a new Bell Fighter*

* *Described by the Office of War Information as "A new Bell fighter, now in production, with a low drag wing and a two stage, supercharged Allison engine which will make it an efficient plane at any altitude up to 38,000 to 40,000 feet."*

When the Axis powers get their first view of this U. S. Army fighter, just beginning to come off the production lines in our Niagara Frontier plants, they'll see it as a slim, trim, single-engine plane. They'll learn next that it has blinding speed... that it can fight effectively high in the sky... or blast troops and tanks from tree-top level. Like the Airacobra, "Cannon on Wings," this plane has plenty of firepower. It throws a paralyzing barrage of machine gun bullets and cannon shells.

Manufacturing this new fighter is one part of Bell Aircraft's war job.

Now add four more chapters—(1) building flexible gun mounts for planes and surface ships; (2) designing and building America's first jet propelled plane; (3) developing the new Bell Helicopter; (4) producing bombers in Georgia—and you have the complete story of Bell Aircraft's war effort.

Yes, Bell is concentrating to speed the day of peace. And the lessons we're learning today mean that you can aim *high* when you think about post-war aviation. © Bell Aircraft Corporation.

MEMBER AIRCRAFT WAR PRODUCTION COUNCIL—EAST COAST, INC.

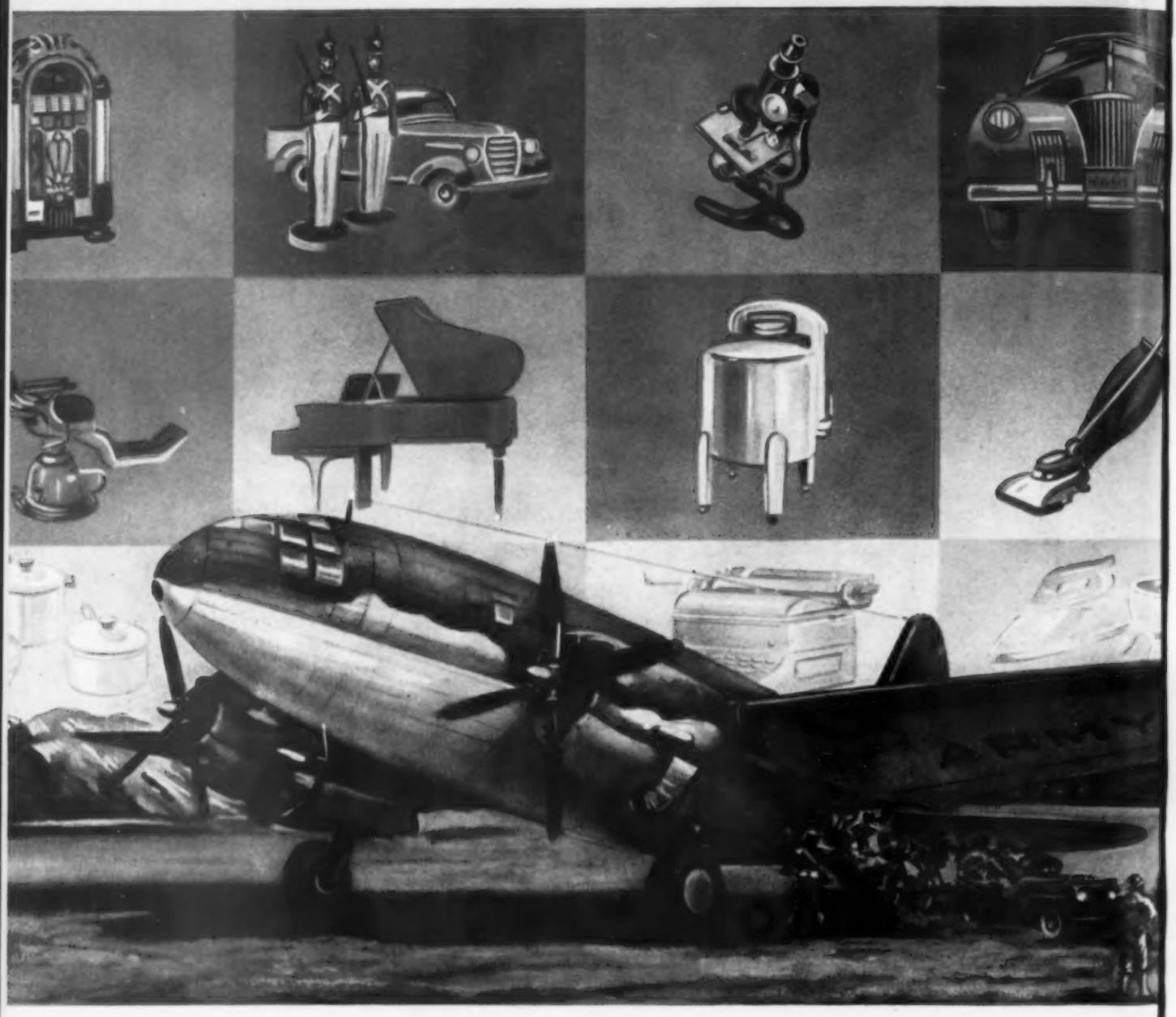
BELL *Aircraft*

PACEMAKER OF AVIATION PROGRESS

Niagara Frontier Division, Buffalo and Niagara Falls, N. Y.—Ordnance Division, Burlington, Vt.—Georgia Division, Marietta, Ga.

BUY WAR BONDS AND SPEED VICTORY

THAT OUR COUNTRY MIGHT *Out-Produce* THE ENEMY



Hundreds of Peacetime Producers Mobilized by CURTISS for Victory

Convert or quit! That was war's ultimatum to a great many American manufacturers. Thousands of them had scarcely digested this, "Get into war work or get out of business" edict before Curtiss-Wright representatives were at their doors.

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Into each plant came Curtiss-Wright men to help solve complicated conversion problems—to assist in installing new machinery, training workers, mapping schedules, meeting quotas.

Thus did Curtiss-Wright, by the speedy organization of a vast subcontracting system, not only protect hundreds of small manufacturers from finding their businesses listed among the casualties of war—*but—took a stride that quickened the production of vitally needed aircraft and vastly accelerated America's war effort!* LOOK TO THE SKY, AMERICA!

Another Contribution of

Curtiss-Wright Corporation

AIRPLANE DIVISION

Toward Winning This War

BUFFALO · COLUMBUS · ST. LOUIS · LOUISVILLE

Member, Aircraft War Production Council, East Coast, Inc.

1894-1944

Pioneers for 50 Years

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**CLECO Pneumatic Tools speed production in metal-working plants. AEROLS (the shock absorbing landing gear used so universally on aircraft) insure safe, smooth landings and take-offs. CLEVELAND Rock Drills are widely used in the mining and contracting fields. CLE-AIR Shock Absorbers protect buses, trucks and trailers from road shocks.*

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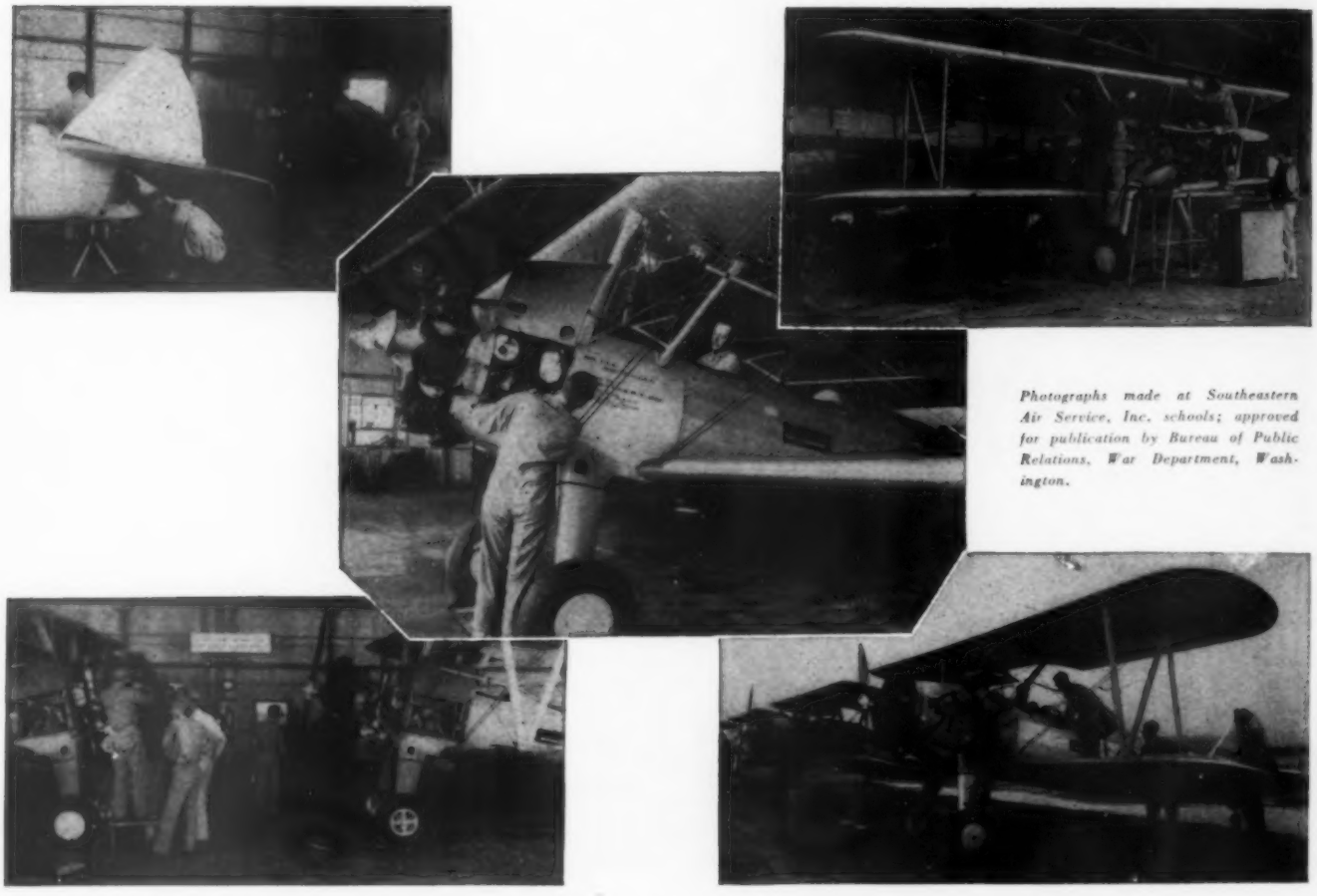
How We "Keep 'em Flying"



Photographs made at Southeastern Air Service, Inc. schools; approved for publication by Bureau of Public Relations, War Department, Washington.

Certainty of mechanical performance is far more important in aircraft than in any other form of transportation. Our investments in shops, hangars, maintenance equipment and skilled manpower are necessarily substantial.

The dollar value of the Army aircraft assigned to our use is also considerable . . . while the safety of the Aviation Cadets assigned to our schools is priceless beyond measure!

We have the right men in our organization, and the correct equipment to insure the successful continuance of our part in Primary Training for the U. S. Army. That is how we "keep 'em flying."

Through this long war even our veteran technicians—both instructors and mechanics—have acquired valuable new experience. This will greatly benefit our services to commercial and private flyers after the war.

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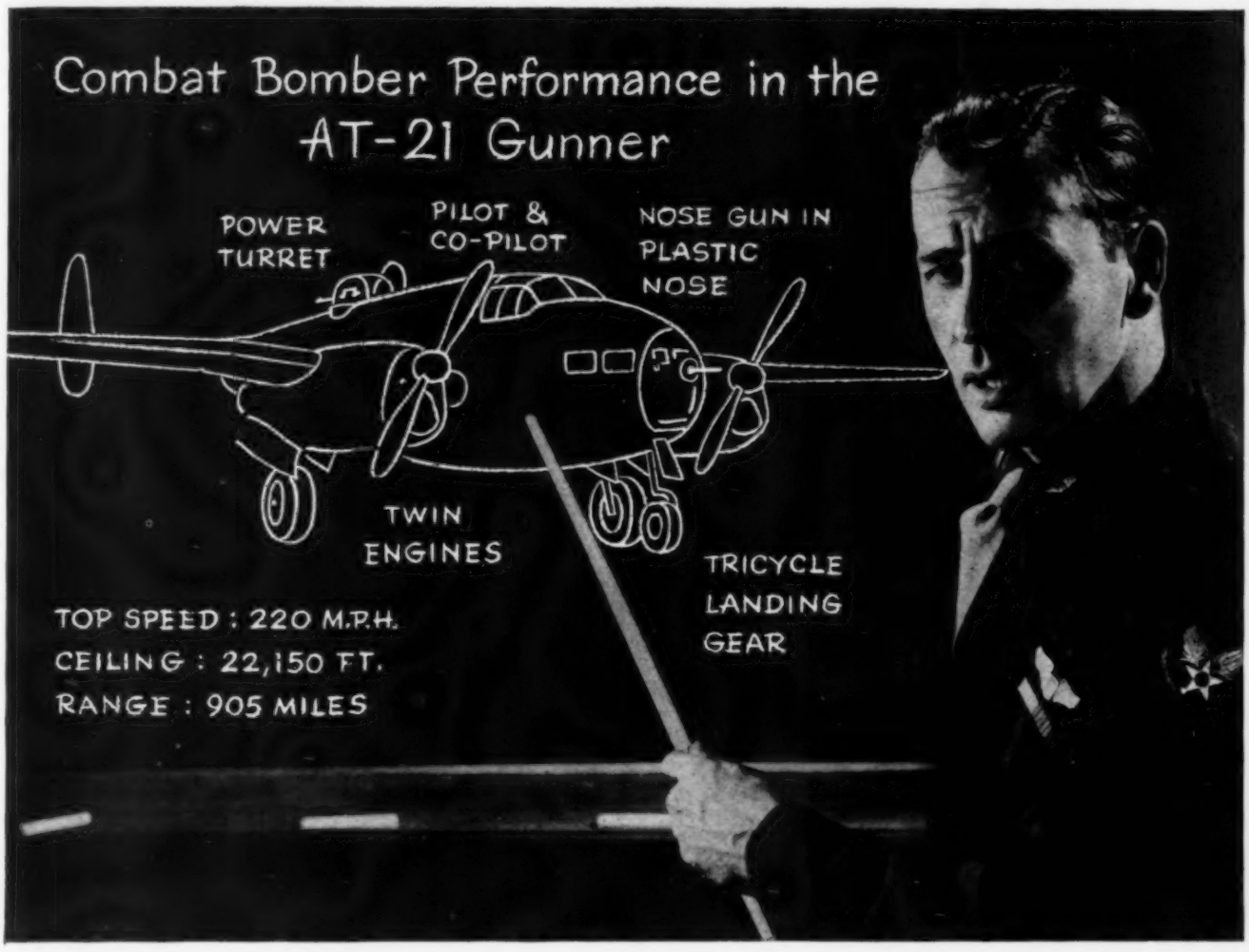


Classroom for Combat

The feel of the fight is built into the Fairchild "Gunner"—an aerial classroom for combat equipped much like those planes that will fly in the assaults on Tokyo.

Fairchild engineers are expert in designing aircraft to do specific jobs well. So, when the Army foresaw the need for a plane with bomber characteristics to train its sharpshooters of the air, Fairchild built the "Gunner." The men who will ultimately loose "squirts" of death into enemy pursuits and interceptors, today can sharpen their skill in a plane that gives them the *feel* of combat operations.

The "Gunner" has twin guns that fire from a power-operated top turret. Its transparent plastic nose houses a manually operated machine gun. Its "office" has controls for pilot and co-pilot. And in landings and takeoffs, the "Gunner" rolls, like the heavies, on a retractable, tricycle landing gear.

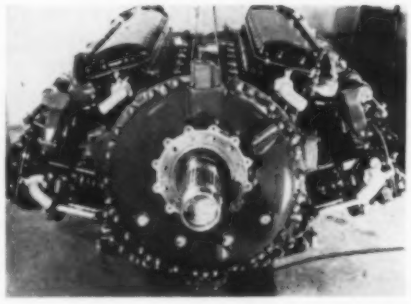
With its two 520 horsepower Ranger V-Twelves for power; with its sleek rivetless surfaces of plastic-bonded plywood fabricated by the famed Duramold process; with the aerodynamic stability inherent in all Fairchild designs, the "Gunner" flies with the Fairchild "touch of tomorrow in the planes of today."

BUY U. S. WAR BONDS AND STAMPS

Fairchild Aircraft *Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland....Burlington, North Carolina*

Allison Reveals 3,000-Hp. Engine

Claimed to be the world's most powerful aircraft engine, a W-type, 24-cylinder, liquid-cooled Allison engine having a maximum rating of 3,000 horsepower was revealed late in May by General Motors, which said it is "at the service" of the Army after passing Wright Field tests. Designated as the V-3420 series, it has twice the piston displacement of the 12-cylinder Allison on P-38's and other ships. GM says 97 per cent of its parts are interchangeable with those of the present Allison. It was specifically designed for "buried" installation, such as in huge multi-engined planes. Its two-crankshaft design makes possible elimination of torque reaction, GM says.



Allison V-3420

Revving Up

ARMY SALES NEXT? Now that the Defense Plant Corporation has disposed of more than half the CAA-WTS single-engine civilian planes, observers expect a move soon to sell surplus Army planes. PT trainers, such as Fairchilds and Stearmans, are on hand by the thousands. In the Central Flying Training Command area alone are believed to be many PT's classified as being in the surplus category. DPC, which will have charge of disposing of surplus Army planes, is expected to advertise the PT's for sale on a bid basis.

★ ★ ★

NEW WASP REQUIREMENTS: General Arnold's office has sent telegrams to prospective Women's Air Service Pilots listing the following as the new requirements: Age, 18 years 6 months through 34; height, 64 inches; vision, 20-20 uncorrected; experience, 35 certified flying hours.

★ ★ ★

PLENTY OF SPACE EXPECTED: Last month Washington announced return of fourteen DC-3's to the airlines, and the expected return soon of fourteen more. Insiders say the airlines can look for still more allocations, with periodic regularity. Within six months the carriers may be operating as many transports as, if not more, than, they did in 1941. Priorities and "bumping" will dwindle.

GAS RATIONING UNDER CAA: With a showdown due momentarily, there is little doubt now that 73-80 octane gasoline will be rationed out to non-scheduled flyers, despite all the protests and logical arguments against additional restrictions. Chances are the Civil Aeronautics Administration will be assigned the task of "screening" the users. Most folks believe the CAA is the only agency capable of intelligently administering the rationing, to the end that airports won't shut down or necessary flying be curtailed.

★ ★ ★

RUNWAY LENGTHS SHRINKING: Airport watchers noting short landings by the new super transports are wondering what will happen to all the "master plans" for 10,000-foot, 12,000-foot, and even 15,000-foot runways. They've also learned that double-wheel landing gear doesn't crush as many ordinary runways as had been feared. The old mile-square airport can handle the biggest, it seems. Before your city dumps millions into fancy plans, how about suggesting a down-to-earth study of facts?

★ ★ ★

NEW PROP FOR PUTT-PUTTS: Much development is under way on low-cost automatic constant-speed propellers for small planes. Outstanding is one called the "Iso-Rev", which requires no outside source of motive power because it utilizes the energy of the rotating propeller shaft, and is a single self-contained unit said to be easily installed on any light or medium horsepower plane. The mechanism consists of two parallel V-belt pulley systems linking the propeller shaft with an adjacent governor shaft. One pulley system has a fixed drive ratio, while the other is comprised of split pulleys and has a variable ratio. The difference between the two ratios causes a change in pitch. The ratio of the variable drive is controlled by a centrifugal governor. Any deviation from the desired speed setting results in automatic pitch change, correcting the deviation and returning the propeller and engine to the selected speed. The device was developed for Army Air Forces liaison and training planes by the Zimmer-Thomson Corp., Long Island City, L. I.

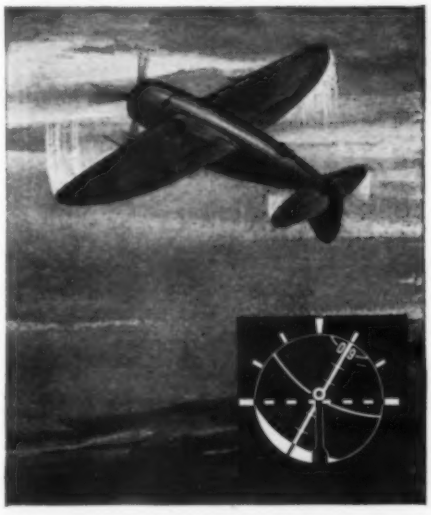
★ ★ ★

FLYING CONGRESSMEN ORGANIZE: A chapter of the National Aeronautic Association has been formed at Washington by Congressmen and their secretaries who fly or want to learn. Rep. Jennings Randolph of West Virginia is chairman pro tem. Others interested are Congressman J. LeRoy Johnson of California, Melvin Maas of Minnesota, William J. Miller of Connecticut and Charles E. McKenzie of Louisiana, all World War I pilots. Also serving the group are Reps. Clifton A. Woodrum of Virginia, Percy Priest of Tennessee, Evan Howell of Illinois, Richard Harless of Arizona, and Fred Bradley of Michigan.

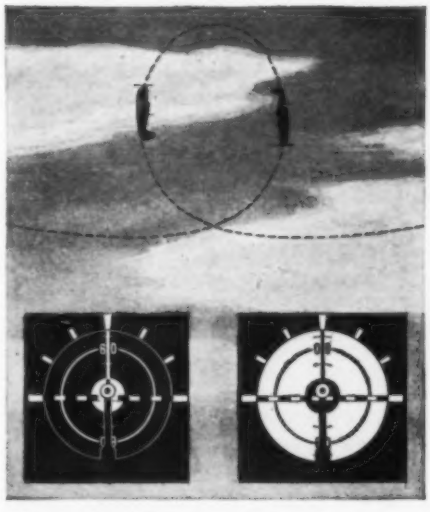
★ ★ ★

BEHIND THE LINES: A German communique last month paid tribute to Col. Walter Oesau, commander of a fighter wing, who was alleged to have destroyed 117 Anglo-American planes before a P-47 eliminated him. That's too many for our credulity. A few days later there was a Russian story about Major Alexander Pokryshkino, a 31-year-old fighter pilot credited with 53 German planes. That's still a whole lot, but more logical than Berlin's hero claims. Maybe they're counting planes destroyed on the ground. They didn't say. In which case the U. S. Navy has several aces who could claim over 100 Japs—sent to the bottom on dive-bombed and air-torpedoed carriers.

Pattern indication gives the pilot a visual "picture" of his attitude at all times, regardless of the degree of bank, climb, or dive.



No angular limitations! The Sperry Attitude Gyro indicates pitch and bank without any angular limitations!



No caging! Because there are no angular limitations, the instrument *never* has to be caged . . . not even in acrobatics!

Attitude Unlimited!

New Sperry Attitude Gyro provides pattern indication . . . has no angular limits . . . needs no caging!

WITH THE NEW Sperry Attitude Gyro Indicator a pilot can, *for the first time,* loop, roll, dive, climb, or fly at any angle with visibility zero, and still always know the attitude of his plane relative to the earth.

The spherical dial is marked to provide the same "pattern" type of indication whether by daylight or by any artificial light . . . a single glance tells the story.

The suspension for the spherical dial of this new Sperry instrument allows full 360° freedom of indication in the roll and pitch axes of the airplane.

A small gyro spinning at 23,500 r.p.m. stabilizes the sphere and keeps it erect in relation to the earth's surface. *The airplane actually maneuvers around the indicating sphere.*

The Sperry Attitude Gyro makes instrument flying safer, easier, and facilitates maneuvers and acrobatic training.

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Morton Air Academy, Blythe, Calif.

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Raymond-Richardson Aviation Company
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Riddle Aeronautical Institute
(Carlstrom Field) Arcadia, Fla.

Riddle Aeronautical Institute
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Southern Aviation School
Camden, S. C.

Southern Aviation Training School, Inc.
Decatur, Ala.

Southwest Airways, Inc. (Thunderbird I,
Thunderbird II and Falcon)
Phoenix, Ariz.

Tuskegee Flying Training School
Tuskegee, Ala.

"They ought to get a citation . . ."

"If anybody in this war deserves recognition, it's the civilian instructors and mechanics at the flying schools."

More than one Army Air Force veteran with a chest full of decorations has said that and meant it. For Army fliers know that the training of the world's greatest flight personnel would never have been possible without the skill and devotion those "forgotten men" of the war effort have given to their task.

On every sky-front where U. S. Army Air Force bombers and pursuit ships strike the enemy, there are airmen who sprouted their wings in Boeing Kaydet training planes, under the instruction of civilian primary flying schools.

The list of such schools is an "honor roll of the air."

MORE THAN 10,000 PT-17 KAYDET PRIMARY TRAINERS HAVE BEEN BUILT AT THE BOEING WICHITA PLANT

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AIRLINES OF WAR

Air power is not only a weapon in this war. The airplane is still pursuing in war its major function in peace—that of transporting men and materials. Airlines of war link the continents, span the seas, and operate hundred-thousand-mile routes to the four corners of the earth.

Humble-Esso Aviation Products have gone to war with all branches of America's Air Forces. In speedy fighters, hard-striking bombers and flying box cars Humble-Esso Aviation fuels, oils and special lubricants are serving for victory.

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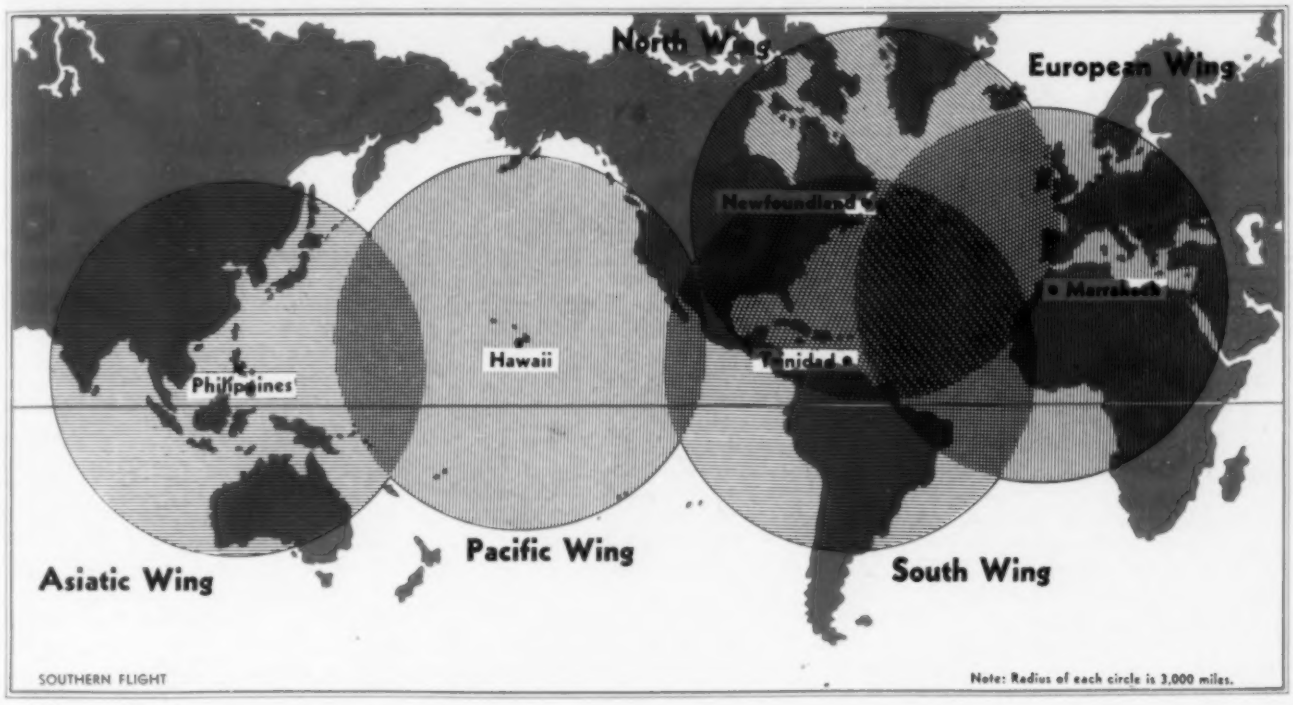


BASES FOR DEFENSE: These grids, each with a 6,000-mile diameter, illustrate how America's postwar Air Forces can blanket most of the world's danger zones with the heavy bombers of tomorrow. Note the overlapping areas of concentrated defenses. As important as the bases and bombers, however, is the degree of preparedness in which they are maintained. The author recommends strong emphasis on mobility be incorporated in postwar air defense plans

Power for Peace

Mere reconnaissance won't keep the peace next time. We must be prepared to seek out and punish, with swiftness, the first signs of aggressive threats to U. S. security. Here's how.

By TOM ASHLEY

DOES America intend to protect itself in peacetime by patrolling the world with an aerial police force? The phrase has great popular appeal. Folks are familiar with policemen, who are supposed to keep the peace around home. They envision a sort of international police force on wings akin to the village constable, the city's blue-coated battalions, the county's roving sheriff's deputies, the state's trooper and the national G-men. What is usually overlooked is that laws, courts and finally militia are more directly responsible for keeping the peace than the policemen. Fear of eventual punishment outweighs by far the criminal's fear of the cop on the beat, whom he can often outsmart.

In seeking world peace an aerial police force, as suggested more frequently in these days of postwar discussion, would amount to no more than a scout, or trouble finder, or reconnaissance force. International criminals would have no more respect for it than domestic hoodlums possess for local law officers. What is needed for American freedom from foreign aggression is an alert American air force, properly conceived, adequately prepared and strategically employed not only to police, or reconnoiter, but to go into action instantly whenever and wherever armed threat to America is detected.

Those who would establish strategic air power as America's first line of defense should take into consideration all available lessons we have learned in the current war, and, with full cognizance of present and already-scheduled future developments in super bombers, proceed with caution in order not to underestimate the full potentialities of air force as a guardian of peace. To air power supporters this sounds simple and easy. But to others, particularly those who have resisted air power developments in the past and those who still would subordinate air power to sea and land power, such a plan is not likely to be favored. This, of course, hardly needs pointing out. But we mention the critical side because we feel a turning point is inevitable, believing it will materialize before the critics and diehards will be prepared to accept it.

Bombers Will Simplify Defense

With this article we have prepared a map of the world, superimposing on it six circular grids. Each of these grids measures 6,000 miles in diameter, and has at its center an air base. The circles are intended to illustrate the radius of action available to future bombers of very long range, land-based bombers which can operate as far as 3,000 miles out from base and return. The point is to show how such bombers will simplify America's defense problems.

Perhaps there are some who will doubt the development anytime soon of land-based bombers capable of such range. It is almost incredible when compared with that of today's B-17's and B-24's, which have restricted strategic air force to an extreme effective bombing range of about 1,200

miles (2,400-mile round trip) as represented by the B-24 raid on Ploesti and other B-24 raids in the Pacific. A 6,000-mile bomber, as we picture, would at least triple the effective bombing range of the B-17. But before calling such a bomber a dream plane, the skeptics need only consider a couple of elementary facts. The B-17 is almost 10 years old, and by some standards of aeronautical development is actually obsolete, even though it is, in company with the B-24 and others, managing to defeat the Germans.

Without referring to any particular type, Army leaders and engineers are constantly hinting at astounding developments to be expected. Experts are available to Congressmen who must lead the way in postwar planning, and those who are responsible will have little difficulty in learning that 6,000-mile bombing ranges will be feasible within a few years—perhaps before the war is concluded.

Future bombers will simplify the matter of locating major air bases for peacetime defense. Although the much-discussed polar routes offer untold possibilities, especially in conversation, we prefer the more familiar areas for several reasons. In the first place polar routes involve too many foreign friends. Secondly, the familiar bases are already established, for the most part. And lastly, it will be difficult enough to "sell" a familiar idea to Washington. So we recommend establishment of the major American air bases at the following strategic places: the Philippines, Hawaii, Trinidad, Marakech and Newfoundland. Each of these should be supported — and protected — by satellite bases, which would provide stepping stones for shorter-ranged bombers, fighters and other types of aircraft.

Air Domination of Enemy Possible

The areas covered by a circle with 3,000-mile radius extending from these bases are vast and important. Our Philippines-based bombers, for example, would bring all of the important Japanese home islands under surveillance, as well as much of Manchukuo, China, Indo-China, Malaya, Burma, India, the Southwest Pacific, Australia, and nearly all of Japan's island outposts where our forces are now in combat. Those based in Hawaii would complete the domination of the Pacific and would offer supplementary protection to the American West Coast and part of the Aleutians. Trinidad-based bombers would protect the Latin Americas, our Atlantic and Gulf coasts, a large area of the Mid-Atlantic Ocean and the South Atlantic, and part of the west coast of Africa. From Newfoundland our bombers could range as far as Ireland and Spain, Iceland and Greenland, most of northern Canada, two-thirds of the way across the U. S. towards the West, to the Panama Canal Zone and South America, and the northwest coast of Africa, encircling almost completely the North and Mid-Atlantic. From Marakech we could patrol—and effectively bomb if necessary every inch of Germany and Italy, because most of Europe would be well within range, as would the Near East, most of Africa, some of South America, and great portions of the South, Mid- and North Atlantic, Iceland and parts of Norway and Sweden.

Bombardment Is an Unequalled Force

AEROSPHERE, for 1943, just off the press (see Book Reviews, P. 56) contains the following comment by Brig. Gen. C. V. Haynes, 1st AAF Bomber Command, and one of America's veteran heavy bomber experts, in reference to tomorrow's super bombers: "The mission of these new aircraft will be more strategical than tactical. Their great range will be utilized to strike at the enemy's resources and economy, to destroy his industrial production and communications, and completely to demoralize his civilian population. Targets will be both area and precision and inclement weather will not hamper operations. Bombardment aviation of today and tomorrow is a striking force whose actual and potential destructive power is unequalled by any other means of modern warfare."

Mobility Is Key

We would base a peacetime bombardment unit at each of these strategic centers, maintaining an Asiatic Wing in the Philippines, a Pacific Wing in Hawaii, a South Wing in Trinidad, a North Wing in Newfoundland and a European Wing at Marakech.

There is more than mere geography involved in such a plan. If properly developed, it offers great advantages for peacetime air training for combat units in development of essential mobility, supply, communication, meteorology and air intelligence, which the next war will demand with much greater severity than ever. The key to all of these is mobility, and every effort should be made to insure its fullest development. Before World War II our Army air units attempted to develop mobility by conducting maneuvers at various points in the United States. They never got around to mobilization exercises which would carry them to Panama, or Hawaii, or the Philippines, although bases were maintained and operated in those strategic areas.

This time we should see that each Wing covers the circuit of our defense net, forbidding permanent basing of tactical units and requiring them to complete the circuit periodically. Since there would be six major bases outside of the United States, each tactical unit should spend six months at each base, thus completing the tour every three years. That kind of peripatetic foreign duty would mean much in many ways, both to individuals, units, the service itself and industry. It would develop air generalship, as well as other unique abilities necessary for global air operations and command; alert preparedness on all fronts guarding our approaches; research and manufacture of specialized equipment for varying climates, and research and manufacture of specialized airplanes and accessories.

Freedom from Tradition

As important to our future air strength as planes themselves is the acquisition of a free and unfettered air policy dedicated to the fullest promotion and development of all phases of aviation, with military aviation as the end product. We did not have such a policy before the war. We do not have one now. Too many persons are apt to view the fight for such a policy as a flash affair by air enthusiasts who seek to capitalize on air power's wartime popularity. They fail to realize how close to defeat this nation was carried by aviation critics who fought and otherwise disabled the heroic efforts of airmen long before the War to build a strong aviation department for national defense.

When Germany invaded Poland in 1939, the GHQ Air Force, which was the Army's combat air arm, possessed only 400 airplanes suited for immediate and effective combat operations (Germany had a first-line combat strength of almost fifteen times that number, plus a reserve pool of ten times the strength of our first-line GHQ Air Force units.) Two years of war in Europe passed, including the downfall of France and the near defeat of Great Britain, and how many combat planes did our Army Air Forces possess? On December 7, 1941, only 1,157 Army airplanes were suited for combat service. Of these, only 159 were four-engined bombers. A mere 526 first-line planes were strategically located to meet Japanese attacks on Hawaii and the Philippines. Within a few hours that number was reduced to 176 by the Japs. Against them, what did the

Japs (we would wipe them out in a couple of Sundays, remember?) have to offer? Nobody knows for sure, but reasonable estimates place the combat air strength of the Jap Army and Navy Air Forces on December 7, 1941, at from 3,000 to 5,000. That is six to ten times the combat Army air strength in the Pacific of the richest, most industrious nation of all —the United States.

This disastrous state of affairs existed because Army aviation in the United States had been all but stifled by tradition and ignorance in high places. There was, for the sake of the record, the antagonistic attitude of the Navy's tradition-bound admirals, who wanted the Pacific to themselves, rather than allow the Army's Flying Fortresses free and unfettered flight hither and yon across the waves. And there was not only outmoded foot army tradition but rank unawareness of air power within the higher councils of the War Department itself.

Why weren't heavy bombers of longer striking range and power than the B-17 developed before the war? Our engineers at Wright Field and in our aircraft industry had the designs under way as far back as 1935 (engineering on the B-15 was done prior to that of the B-17, as the serial designation shows). Strategy for their employment is not new (Billy Mitchell conceived it; Frank Andrews, Hugh Kneer, Gerry Brant, Robert T. Olds and others blueprinted super bomber strategy beginning in 1935). The truth is that there is nothing new about very long range bombers but their belated production. And the reason we did not produce them sooner is that officials outside but in control of U. S. air power refused to have them produced before the war. In 1937-38 Andrews and his heavy bomber experts pleaded with the War Department for the quantity purchase of B-17's. Secretary of War Woodring answered their pleas with a contract for only one (1) B-17, and then slapped them in the face with an order for 177 obsolete twin-engined B-18's. There were many deterrents to heavy bomber development, but this one act of strangulation proved disastrous enough to affect our war effort year after year until the present day, six years later, when we find our Air Forces desperately in need of super types.

An independent department of aviation can prevent a recurrence of this kind of stupidity. This independence must be the No. 1 consideration in shaping the future of American air power. Without it frustration will continue to strangle future development. ★ ★ ★

WHAT IS AMERICA GOING TO DO?

(Last month the Select Committee on Postwar Military Policy of the House of Representatives heard the aircraft industry's recommendations for postwar air power. It was delivered by J. Carlton Ward, Jr., president of Fairchild Engine and Airplane Corp., and a governor of the Aeronautical Chamber of Commerce of America, Inc., who said, among other things, the following:)

WHAT of our record? It is uniform in that we never have been prepared for war and hence our wars have been critical, costly and unduly prolonged. But the tragedy is, that in the two great world wars in which we have been involved, even with our great potential strength and resources, we have had to live on borrowed time until we could prepare ourselves to take our place in the conflict while other nations carried the ball.

Let us be honest. In the Revolution, we fought only a part of England's might while she was otherwise engaged in European involvements. In 1812, the major part of the British Fleet was in conflict abroad and not with us. In 1861-5 the industrial North was whipped by an agricultural South until the weary, bloody years dragged on to provide time for the industrial resources of the North to be harnessed. In the Spanish war we fought a European nation one-third our size and a nation that was fast losing its place as an important world power. In World War I we fought with British and French guns, airplanes, and supplies and boasted of our complete unpreparedness a few months before we were plunged into that war. The hour of our fate as a nation nearly struck on several occasions because of this fact. We emerged victorious largely through the power of Wilsonian doctrines and not through the force of arms upon our major enemies.

And in this war, General Arnold addressed the graduating class at West Point in 1940 and pointed out that with the world aflame, Congress —that is the people—had given the Air Corps funds for less than 100 combat planes for the fiscal year. He also pointed out that it was not until seven days after Dunkirk, with France practically out of the war and the best of the British Army utterly routed, that the Air Corps and the Navy got a total appropriation for 5,000 aircraft for both services.

Again our fate as a nation hung in the balance—and the world knows the poignant story of "Never had so many owed so much to so few" which, in the words of Churchill, explained from whence came the borrowed time that will ultimately lead to the defeat of our enemies in this conflict, **but at what cost!**

What should we do and when?

This Is What America Should Do

Now is the time, in my opinion, to: 1. Effectuate a plan for compulsory military, naval, and air training. 2. Freeze stockpiles of strategic materials that have been mined, imported, or fabricated at great cost and which will accomplish two important things. (a) It will keep available the raw materials for instant war activity or preparation therefor in the face of a sudden war emergency. It must be kept in mind that this country's natural resources are constantly diminishing. It may be more difficult even if time is available, to make these accumulations in the future. (b) This work would keep up the postwar employment level which otherwise would be depressed by distressed markets if the government should put the stockpiles back into commerce. 3. Retain the great specialized government-owned industrial facilities as **surplus emergency arsenals**—ready at all times to support the combat front if needed. To put these into competitive operation with private industry during peacetime would be disastrous to the national interests. 4. Set up a procedure for the Army, Navy and Air Forces whereby, at the termination of hostilities and when political and practical expediency demands the immediate cancellations of war orders, continuation of critical technical developments and research projects so important to our future arms, wherever so recommended by the military and naval authorities, will be assured. 5. Put into action an overall peacetime plan for **total** war mobilization in the event we are faced with another international crisis. We should remember that the world has in the past been thrown into great wars throughout the ages and that the causes continue to remain with us even as we emerge from this war. 6. Encourage a strong civil air force and merchant marine as vital military reserves, and as instruments of future military policy. 7. Retain our right to advanced bases without which we would be at a tremendous disadvantage in the global wars that may have to be fought in the future. Do not neglect the unsettled and unexplored regions which will become part of the active world as the air age develops. 8. Sponsor an educational approach to be taught in all the schools of the land to all of our citizens that they may know the truth of our history, the causes and results of war, in order that our future citizens may realize the bloody price of ignorance in these important matters.

Oklahoma CAP "shooters" and "spotters" show their kill after a recent hunt. The coyotes fell before shotguns fired from low-flying Piper Cubs.

CUBS vs. COYOTES

By ALMA JOHNSON
Warrant Officer, Oklahoma Wing, Civil Air Patrol

RUDDER right! Rudder right! Straight south. 'Bout half mile!"

"Moving?"

"On the run. South . . . No! He's veering to the west. South by west!"

"I see him!"

The pilot throttled back and put the plane into a smooth glide. The gunner drew a bead on the enemy below. For an instant the only sound was the wind whistling through the struts. Then one blast from the gunner and the enemy, shot on the run, leaped into the air, came down heavy and rolled over on his back all four feet in the air—another coyote bit the dust. The pilot of the J3 yellow Cub circled until his gunner was sure of his kill. Then they headed down the ravine on the alert for another enemy.

The coyote an enemy? Some folks say not. But they haven't flown over 8,000 square miles of Oklahoma infested with these marauders. They haven't seen half-eaten carcasses of cows and calves and sheep, rotting in the sun. They don't know that farmers and ranchers have lost nearly $30,000 worth of livestock this past year. They don't realize the coyote is on a rampage that is hard to stop because of the lack of ammunition and the scarcity of hunters.

To Major David J. Perry, CAP Operations Officer, Oklahoma Wing, and to William W. Morgan, Aviation Chairman of the Oklahoma City Chamber of Commerce, goes credit for organizing the hunt. Working with them were Colonel Moss Patterson, Wing Commander; Jeff Kendall, State Game Warden; Bud Gentry of the Highway Patrol and hundreds of farmers and ranchers in the communities adjoining the towns of Woodward, Weatherford, Hobart and Frederick. This four-day experimental hunt included fourteen counties of western Oklahoma.

Shooting coyotes from the air wasn't new to Oklahomans — especially not to Henry Bomkoff who has nearly 600 to his credit. But this was the first time permission had been given for an organized hunt that included a crew of ground hunters.

There were four Shooter Planes — three J3 Cubs and a 65 Taylorcraft. These were piloted by men with at least a Commercial License, most of them with more than 1,000 hours in the air. The gunners not only were expert marksmen, but had experience as pilots and knew the dangers involved in shooting from an airplane.

Dangerous Business

Hunting from an airplane is a hazardous undertaking and Al Young, CAA Inspector in charge of the Shooter Planes and a pilot of one, was on the job during the entire hunt to make sure there was no serious accident.

"Look out for other planes," Al warned at each meeting preceding a hunt, "and look sharp. You can't fly away with a bent fender on your puddle-jumper!" He admonished the pilots about the danger of stalling out in a tight turn. "There's almost no warning in a power-on stall. Watch your airspeed. Don't make those turns too tight — even if it means losing the coyote. Although Bomhoff here," Al smilingly indicated the ace hunter, "has been saying that he 'herds 'em in with one wing' I know that isn't *quite* true. I've hunted with Henry and I find him a cautious pilot. I know that, in this exciting work of circling and closing in for a kill, he keeps one eye on the ground with the coyote, another in the air on the lookout for other planes — and his whole body attuned to that little crate he's maneuvering into position for his gunner."

"Exciting work" is hardly strong enough to describe the thrill that awaits the pilot and his gunner who spot a coyote for the first time. This calls for perfect co-ordination between the two men in the plane. And the pilot flies at low altitudes with a skill that few ordinary private pilots ever attain.

The pilot will get a kick out of maneuvering his ship to follow the running animal. It is keen, absorbing work. And something new to be above the prey. He'll soon discover that he's doing one of the finest jobs of flying he's done in years. He is definitely on the alert and 'flying by the seat

To save war-vital livestock, CAP planes are hunting coyotes from the air. In a recent offensive 230 marauders bit the dust during a 200-hour hunt. Champion Huntsman Henry Bomkoff has nearly 600 animals to his credit.

of his pants'. He may be thinking: "The 'bible' says at least 1,500 feet for acrobatics — but watch that coyote do Immelmans!"

The gunner never takes his eyes away from his prey once he's spotted him. He keeps the pilot posted on the coyote's movements. Then, as they circle and close in for the kill — if the animal doesn't change his course so they have to make another approach—the gunner draws a bead on his victim. And he might be talking to himself as he does it: "Don't hit a strut. Or the propeller. Keep that wing up, Mr. Pilot. Correct for drift. Make allowance for the speed of the ship and the running coyote. . . "

Lawrence Eichmann, instructor at Cimmarron Field, was Bomhoff's gunner. "Ike" shot eight coyotes one morning. But he admitted to a novice hunter: "We've done quite a bit of hunting on Henry's farm. Take time —about flying and shooting."

Some "Shoot", Some "Spot"

The four Shooter Planes were always the first to take off each day of the hunt. The anxious pilots and gunners with their shotguns were in their ships and had the engines warm so they could take off on the exact minute of official sunup. They flew low, each plane on its own, scouting the entire territory of the hunt.

The hunt usually started as soon as they left the traffic pattern. There was a prize given each day for the first coyote killed and delivered to the airport. Frank Tisdale and Evert Eversole, Grandfield, made the prize-giving rather monotonous by collecting the prize money every day of the hunt. At Frederick on the last day they spotted their coyote, killed him and were back to the airport with the victim in less than thirty-five minutes after they took off.

The Shooter Planes usually worked territory that was difficult for ground hunters. Their specialty was "driving" the animals into the open for the kill. It was simple to get the coyote if he was in open country. And it was easy to keep him spotted when he was on the run—but he likes to run down small gullies; he goes through a herd of cattle or swims a small lake hoping to throw the hunters off his trail. When he isn't moving the coyote is almost the exact color of the winter pasture grass. It takes a good observer to spot him and a better one to keep him spotted. The average coyote runs about forty miles per hour and it takes an expert pilot to keep him in sight while circling at low altitudes.

—Ronald Gordon Photo.

GOVERNOR ROBERT KERR of Oklahoma congratulates CAP Lieutenant Clayton Johnson at Woodward on the first day of a big aerial hunt. Four coyotes were bagged from the air to open the operations.

There was another group of airplanes that participated in the hunt, although in not so spectacular manner. These were the ten or twelve Spotter Planes. There was no shooting from these planes that flew at least 200 feet or higher. They spotted the coyote and signaled to a crew of ground hunters who made the kill.

It was just as difficult and as exciting for the Spotter Plane to keep his victim in view as it was for the Shooter Plane. And, as one pilot's observer put it: "When you look down below you and see from fifty to two hundred hunters—men parked in cars at the intersection lines; men shouldering guns being dropped at strategic points by a big red truck; men already on hilltops with guns ready; men sitting in the back of a pick-up truck with leashed greyhounds—when you look down and suddenly realize that all those hunters are looking up at you, waiting and depending on you to spot coyotes, believe me, this becomes mighty serious business!"

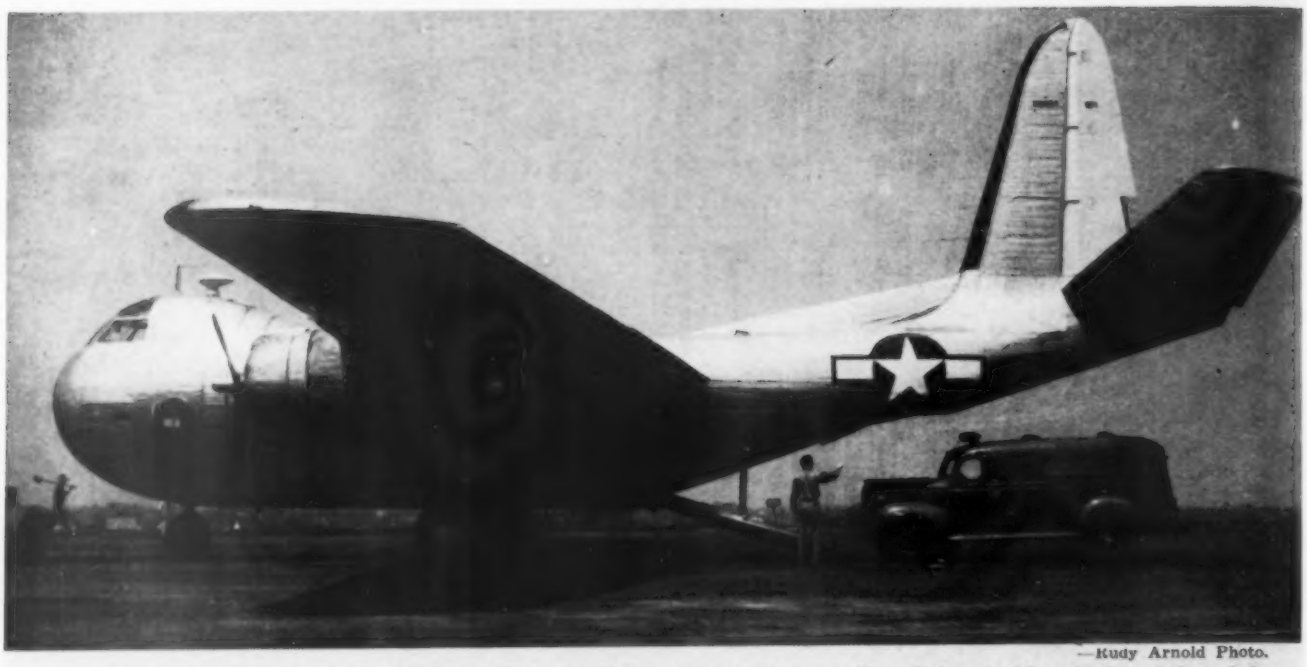
230 Kills in 230 Hours

There were numerous times when the coyote ran out of the area surrounded by hunters. It was indeed a good pilot and a keen-eyed observer who managed to "herd" that obstinate animal back toward the hunters. But it can be done. Forrest Watson from Thomas was acclaimed the champion spotter. Mary Francis, Oklahoma City, insists that: "They can be herded all right. But not from 500 feet; nor from 200 feet." The inspector was listening attentively to Miss Francis' discussion but she never did say just what was the best altitude to "herd" her coyote.

Most of the airplanes stayed and hunted the entire four days. In all they flew 200 hours. The first three days of the hunt most of the planes were grounded by high winds by 10 o'clock. A check with the Weather Bureau showed winds from thirty-five to sixty miles an hour on April 14, 15, 17. But April 18, the last day at Frederick was perfect flying weather. Three-fourths of the coyotes killed that last day were shot from the air —regardless of the fact that there were only four Shooter Planes in the air and more than 400 hunters on the ground.

So, as the experimental hunt came to a close, and Major Perry suggested his Flying Hunters head for home, they all began talking about another hunt. They had flown 200 hours. Two hundred and thirty coyotes had been killed. If Governor Kerr was right in his estimation that every coyote killed would save ten useful animals, then the flyers and ground hunters together had saved 2,300 head of livestock. They believed they deserved another hunt — with all the special permissions it takes from Washington on down.

★ ★ ★



—Rudy Arnold Photo.

Here's the Navy's new welded stainless steel "Conestoga", a twin-engined cargo plane designed with a 25 ft. x 8 ft. x 8 ft. compartment and inclined ramp for vehicular loading, a tri-cycle landing gear for small fields, and overall efficiency for short hauls

Stainless Steel Cargo Plane

DEVELOPMENT of a short-range, pot-bellied cargo plane of welded stainless steel, holding not only much promise for military cargo flying but for future commercial operations, has been revealed by Edward G. Budd Manufacturing Company of Philadelphia, famous for its stainless steel railroad trains. Budd announced it had already started full-scale production for the Navy on a quantity of the twin-engined, high-tailed transport, which has been called the "Conestoga." It was designed in 1942 and flight-tested last year.

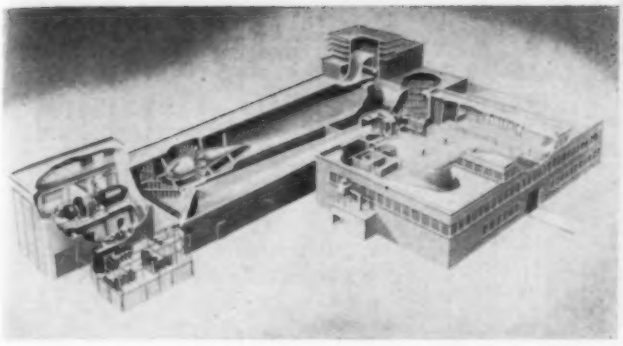
Powered by two 1050-hp. engines, it is sixty-eight feet long, has a wing-spread of 100 feet, cruises at 165 mph., and, at a gross weight of 33,800 pounds, can carry a maximum cargo load of 10,400 pounds over a maximum range of 650 miles. Maximum range with available fuel tankage is about 1,700 miles, and this can be boosted to 3,500 miles with auxiliary tanks.

Looking strictly "work horse," the Conestoga was built around a cargo compartment, designed to be as clear of obstructions as possible. Even the crew was moved out of the way to accommodate the cargo, for the pilot cabin is perched atop the nose in a bulbous section protruding upward from the fuselage. Another innovation to allow for clearance inside the cabin was the design of the wing, which does not pass through the fuselage in conventional manner. Instead, the wing is joined by five special side frames, connected across the body by shallow, transverse members. This left a cargo space twenty-five feet long, eight feet wide and eight feet high, wholly unobstructed. The floor is horizontal for ground loading and unloading, accomplished by means of a large hatch in the rear. The upward sweep of the afterbody, hoisting the tail section far into the air, furnishes ample clearance for trucks to move in close to the cargo hatch. Both an ambulance and a jeep can be rolled into the cabin. A specially designed hoist and a manually operated winch facilitate handling of heavy freight. For use as a troop carrier or ambulance, provision is made for twenty - four seats or twenty - four stretchers. Side doors permit launching of paratroops from port and starboard simultaneously, and rear clearance doors may be used for dropping supplies by 'chute.

—Rudy Arnold Photo.

Inside of "Conestoga" looks like this. Vehicle is amphibious jeep. There's still room for an ambulance truck.

The Conestoga is the second welded stainless steel airplane built by Budd. The first, built in 1931, logged hundreds of hours here and abroad, and is now on display at the Franklin Institute. Dr. Michael Watter, who directed Budd's design staff on Conestoga under sponsorship of the Navy, formerly designed planes for the Chance Vought Corporation. The models on which he worked were the original Corsairs, predecessors of today's powerful fighters; Later he designed heavy types for Burnelli Aircraft, Ltd., and from 1936 to 1939 was project engineer for the Glenn L. Martin Company, working on designs for medium- and long-range flying boats, including the PBM Mariner and the new Mars. ★ ★ ★



Wind velocities with the speed of sound are now used by Boeing for research on new airplane designs. Cutaway drawing at left shows, left to right, 18,000-hp electric motor and auxiliary motors, giant 24-ft. fan and streamlined nacelle for reducing turbulence, controllable interchanger tower for changing and cooling air, banks of louvers for sweeping wind around corners of 450-ft. tunnel, test section large enough for 11-ft. models, and adjoining laboratories. —Boeing Drawing.

Super Tunnel For Super Bombers

By R. T. GIDLEY

ORDINARILY we think of a 700-mile-an-hour wind as something horrific—a hurricane such as nature seldom inflicts on humanity. Winds with that incredible velocity can now be artificially created and harnessed for the advancement of American warplanes and aircraft for postwar commerce, thanks to some ingenious engineering by the Boeing Aircraft Company, which recently dedicated at Seattle, Wash., its Edmund T. Allen Memorial Aeronautical Laboratories. A 700-mph wind tunnel is the keystone of the laboratories.

In this "fastest large wind tunnel in America", future Boeings are being "test-hopped" in man-made hurricanes that approach in velocity the speed of sound. The planes subjected to the stresses of these gales are scale models, so accurately built, and the wind forces on them so precisely measured, that when the miniature plane's reactions are reduced to figures, Boeing engineers can learn how its full-size replica will perform in the air.

Model planes with wingspreads up to eleven feet, or full-scale airplane sections of the same maximum size, can be tested in it. An intricate Boeing-designed system of balances, capable of measuring lifts of from one-tenth of a pound up to 8,000 pounds, records all the forces acting on the model being tested: lift, drag, yaw, pitch, roll and side force. At the touch of a button an automatic printer records and prints on a tape all the forces acting on the model at that instant.

Naturally enough, the tunnel called for the solution of a number of problems such as the elimination of vibration disturbances from outside sources as well as within the tunnel, the design of a fan capable of stirring up a 700-mile-an-hour wind, and the smoothing down of the inside of the tunnel so that it would offer the least possible resistance to this terrific gale. How well Chief Aerodynamicist George Schairer and his assistants solved these major problems is indicated by such notable construction features as the great Boeing-designed propeller-like fan, twenty-four feet in diameter, consisting of sixteen laminated spruce blades; the four banks of louvers, or high vanes, that guide the hurricane smoothly around corners; the first controllable interchanger ever built; and the adjoining aerodynamics laboratory with its model shops, engineering offices and tunnel operations room, permitting Boeing engineers to design, build and test models in the same building.

—Boeing Photo.

Mrs. Edmund T. Allen, for whose famous pilot-husband the tunnel was named, and Lt. Gen. William Knudsen shown inspecting a 11-ft. B-17 model in the throat of the new tunnel.

The huge fan is driven by an 18,000-h.p. synchronous electric motor, which maintains a constant speed of 514 revolutions per minute. The speed of the fan is regulated by a great magnetic coupling or "clutch", several times larger than any previously built, which is installed between the motor and the fan. This coupling, built by the Dynamatic Corporation, operates on a magnetic principle and regulates precisely the speed of the fan so that airplane models or parts can be subjected to exact wind conditions. Two revolving metal rings, with no mechanical connection, are inside this coupling, the ring on the motor side being magnetized so that when it turns it pulls the other ring around in the same direction, thus transmitting power from the motor to the fan shaft through air.

The tunnel bore is a complete, continuous rectangular structure. It varies in size from eight feet by twelve feet in the "throat" or test section to twenty-seven and one-half feet by twenty-seven and one-half feet at the largest part. When operated at high speed, the air completes the 450-foot circuit in less than two seconds. Inasmuch as 11 per cent of the air in the wind tunnel is expelled and replaced with fresh air at every "round trip" for cooling purposes, under high speed operation the air in the tunnel is completely replaced with fresh air three times per minute. A pagoda-like structure, known as an interchanger tower, is located atop the tunnel building and is used for the intake and exhaust of this air.

Convenience for those who operate the tunnel was given careful consideration by its designers. A monorail system carries the models from the construction shops into the test section; disassembly of models is not required—a far cry from the former practice of transporting models to distant wind tunnels for testing. Complete sound-proofing throughout makes tunnel noises scarcely audible in adjoining quarters. ★ ★ ★

Rambling Radius of Action

By LARRY J. FISHER
1st Lt., CAP, TFP

AT LAST! I can pretend to be very learned (for the moment at least) in this chapter of our Unscientific Method of Navigation.

Out of all the plethora of navigational formulae and its ramifications we come now to the only formula I could ever remember. It's the one for computing Radius of Action.

Lately, however, I found it was excess baggage. My little pal, the E6-B, has eliminated the need of it. This computer can work a Radius of Action for you with never a scratch of constructional work on paper.

Lest any of my Unscientific Method (etc.) students get the idea that the maker of the E6-B Computer is subsidizing teacher with a big red apple, I hasten to add that the "Dalton Mark VII", "Private Pilots" and similar computers will work it out just as neatly if they have the same type of slide rule face.

Radius of Action: Graphic Method

First, let's look over the traditional graphic method, omitting all the usual verbiage and bringing the thing down to two simple triangles.

If you will remember in the April issue, our triangle was made up of a short side (the wind); a dotted side (air speed and true heading) and a third side, solid line representing true course and ground speed.

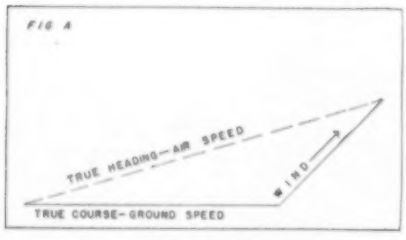


FIGURE A

As previously mentioned, practically all navigational problems are based on its three cockeyed faces. Memorize it and be richly rewarded.

Okay, let's see. First, we need a R/A problem. We want to crank up our crate, head out and get back to Base with one tank of gas—sort of ration-boardish.

True course: 90 degrees
Air speed: 80 miles per hour
Safe gasoline: 6 hours cruising
Wind: 25 mph from 330 degrees

We want to know: 1. How far to fly out before turning back? 2. What is time to turn? 3. What are ground speeds out and back? 4. What are headings out and back?

Sounds like a lot to ask but it can be figured on the ground before you ever climb into the cockpit. However, don't blame me if the wind changes and your beautiful preflight computations land you in a cornfield 20 miles short of the airport.

Anyhow, we now begin our first tottering steps of a Radius of Action problem (returning to same base.)

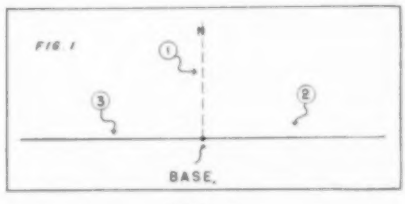


FIG. 1

1. Lay out North reference line.
2. Plot course out (90 deg.); indefinite length.
3. Since you are to return to same base, might as well lay out the reciprocal at the same time. That's 90 plus 180 equals 270 degrees.

There then is the first side of our triangle, the true course and ground speed side. We proceed to the next side by plotting out the wind.

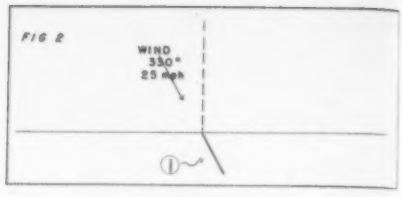


FIG. 2

1. Remember, your pencil goes *down wind*. The wind is *from* 330 degrees. Use any scale you wish to represent the 25 miles per hour velocity.

Now we have two sides of our famous three-faced friend. The airspeed—true heading (dotted) line will complete it.

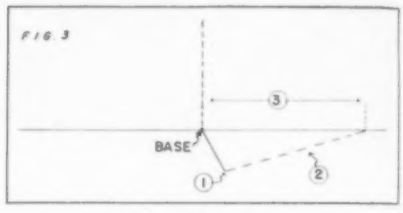


FIG. 3

1. From the end of the wind line, swing the 80 mph airspeed line to intersect the true course (90 deg.) line. Make this a dotted line.
2. Measure it in degrees and find true heading of 74 degrees. Remember airspeed and heading always go together and that *heading* is a dotted line.
3. Measure from Base to intersection of above and find ground speed of 89 miles per hour. This, of course, is the ground speed out, for ground speed is found on the *true course* line.

Now we have all the dope for the outgoing trip. To be equally well informed on the return trip to base, we merely do another triangle.

The nice part is that most of it is already finished. We have the true course back (270 deg.) already plotted; the wind is already drawn and we're optimistically thinking that it will not change. So let's find the third side:

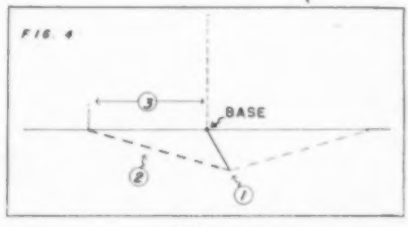


FIG. 4

1. From the end of the same wind line, swing the 80 mph airspeed line to intersect the 270 degree true course for return trip.

2. Measure in degrees for true heading and find 286.
3. Measure from Base to above intersection and find ground speed of 64 mph on the way back to home and mamma.

Now we're ready to set up in business and I'll get to show off the only formula I know. Here it is and pardon me if you've heard this one before:

G/S out x G/S back divided by: G/S out + G/S back equals Radius of Action or how many *miles* you can go out in one hour before turning back.

In case you tuned in late G/S is abbreviation for Ground Speed.

What's that? Yep, I know I left out something but, as mentioned in previous dissertations, if you have the dope for one hour, it's easy enough to multiply by "x" hours later. Why confuse things just now?

We've got a nice scientific formula above, so let's apply it to our particular problem:

1. G/S out 89 x G/S back 64 equal 5696
2. G/S out 89 + G/S back 64 equals 153
3. and 153 guzzinta 5696 about 37.2 times.

So we see that 37.2 miles is how far we can go out before turning back in one hour.

4. Since we have 6 hours fuel, we multiply 37.2 by the six and find our total radius of action for six hours is 223.2 miles.

The pause while you chew on the .2 gives me the chance to remark that 223.2 miles is the point where you give your trusty little crate a graceful "about face" and head back for the base.

Ah! But how do we know when we have reached that point? I can't agree fully with one of my more brilliant students who answered that question by saying, "You look down at the ground."

A more trustworthy place to look would be at your watch. To find the time to turn homeward, divide the 223.2 miles by the ground speed out (89 mph) and you'll come up with 2.50 hours.

Note carefully, fellow log-book-padders, that this is NOT two hours and fifty minutes. The 2 represents hours, all right, but the 50 represents 50/100ths of an hour. To find the minutes, multiply the .50 by 60 (because 60 minutes in an hour) and find 30, which, strangely enough, is 30 minutes.

So we summarize: The distance out to turn is 223.2 miles. The time to turning point is two hours and 30 minutes after your panting T-craft finally struggles off the runway with that six hours of gas and says to you, "Well, bud, we made it. We're airborne."

P. S. Don't ask how I got six hours of gas into a T-craft. An inspector might be listenin'.

Radius of Action: E6-B type computer.

We continue in our Unscientific Method of Navigation with special instruction for those lucky dogs who strut around with E6-B type computers. Just in case you don't have the September, 1943, issue of SOUTHERN FLIGHT in your pocket, we'll review a wind problem as we go along our merry way.

Let's use the same problem: True Course out 90 degrees, Air Speed 80 mph, safe gas 6 hours and wind 25 mph *from* 330 degrees.

Remember with the E6-B always plot the wind first and figure INTO the wind. That is, you count *up* from the center dot to mark off the wind velocity.

As a footnote: You will in the course of your long and brilliant career meet E6-B users who were not trained in Fisher's Unscientific School. They may look down their nose at you and state, with a lordly air, that "everyone knows that the wind is plotted down wind."

Your answer is to propose a race on a simple drift problem, betting cokes to make it more interesting. The computer twister to give the correct *heading,* etc., first will be the winner and, from this distance, I can prophesy that you will win while he's still warming up with his downwind method.

Anyhow, to get back to our problem:

TO PLOT THE WIND ON E6-B TYPE COMPUTER:

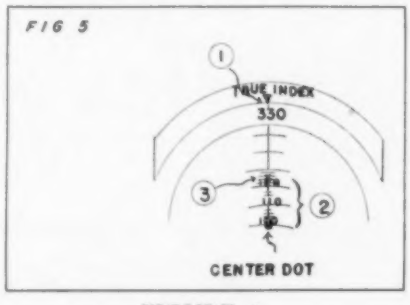


FIGURE 5

1. Set wind direction, 330 deg. below true index.
2. Using center vertical line as a scale, count up *into* the wind for velocity, 25 mph. It is convenient to set 100 on the slider to the center dot but any figures on the center scale may be used for this measurement.
3. Make a cross mark or a dot on the window at the 25 point. Use a soft pencil.

TO FIND GROUND SPEED AND TRUE HEADING:

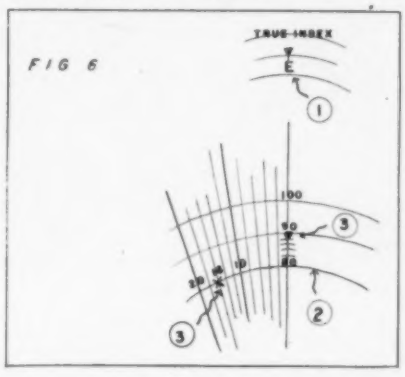


FIG. 6

1. Rotate window until course out, 90 deg. (East) is below true index.
2. Slide slider to put 80 mph airspeed curve on the pencil cross mark.
3. Read ground speed (89) on center dot.
4. On the slanting lines, read 16 deg. drift CORRECTION. You really don't have to bother that busy little brain by worrying whether this is drift or drift correction. Here's the easy way out. (This is where you'll win the race previously mentioned.)

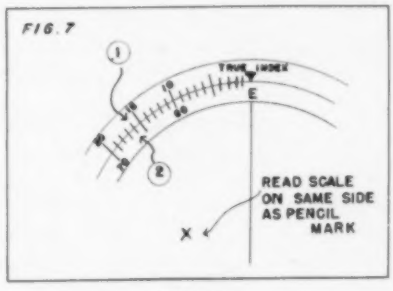
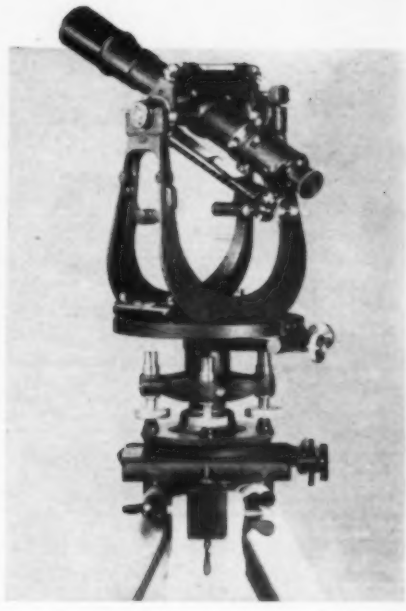


FIG. 7

1. On the top edge of the computer on the same side as the pencil mark (in this case left of the True Index) locate the 16 degree mark on the scale.
2. Directly below it, on inner scale, read your TRUE HEADING, 74 degrees.

I claim that's neat — never a care or computation about drift. Let the computer worry for you.

(Continued on page 38)



—Top, Douglas Photo; Right, Surveyors Service Photo.

Piano wires and plumb lines used to hinder accuracy in controlling the size, shape and interchangeability of aircraft components. The Douglas Aircraft Company operators above are shown remedying the situation by placing a jig point with precision instruments. At right is the new Berger Aircraft Jig Collimator, a perfection of the surveyor's transit.

PRECISION JIG CONTROL

OUT of many bottle-neck production problems have come new ideas. In actual production, needs sometimes appear that would not be visualized elsewhere. Here and there a single "plant suggestion" becomes the basis for developing a completely new tool, changing methods of production, or saving many man-hours of labor.

So it is with the new Aircraft Jig Collimator, a working plant idea that turned into an effective reality; a new tool that easily makes for a 500 per cent saving in time.

Aircraft sub-assemblies must be hand-fabricated to a great extent. In order to insure interchangeability of parts, master tooling jigs are constructed, from which production or assembly jigs are built. These tools or guide structures are so large that many problems arise in controlling the position of the points which in turn control the size, shape and interchangeability of the finished part.

In the early days of aircraft production, which was not so much production as it was "tailoring", this control on jigs was accomplished by stretching fine piano wires as horizontal and vertical guides.

The horizontal wires were clamped in position, while the vertical ones were plumb lines dropped from the top of the jig with their plumb bobs suspended in buckets of oil. These wires had to be carefully and tediously set and checked for position and for freedom from obstructions, sag or stretch. They had to be constantly corrected, particularly for allowances for stretch and oscillation. In plants not air-conditioned and temperature-controlled, the changes in temperature, especially during change of shifts, caused expansion of the jigs so that clamped wires buckled or snapped. And, fine as the piano wires were, allowances had to be constantly kept in mind to compensate for the thickness of the wires in locating any point.

As the size and complexity of the jigs increased, more difficulties arose from this manual method of measuring. An actual increase in size of the jigs necessitated having longer wires. The sag increased and became a continual source of trouble, error and consequent confusion.

Oftentimes points were aligned with relation to the "center-line" of the jig in such a manner that a very complicated arrangement of both horizontal and vertical wires was necessary. If these wires were removed when the jig was actually put to work, or if the jig was moved or changes in it were required, then the whole long process of resetting the wires had to be repeated.

Surveyors' Instruments Adapted

From this great tangle of piano wire, confusion and wasted man-hours came the cry for something more accurate and less complicated. Basically the answer was in projecting optical lines to the elimination of the wires.

The use of surveyor's levels for horizontal extension of optical lines developed when structures grew in size and complexity. Then surveyor's transits were used to take the place of the vertical plumb wires. The lines were optically extended with more accuracy than could ever hope to be attained by the use of plumbing wires. Surveying instruments began to be used by jig builders in much the same manner in which a structural engineer uses them to control the erection of bridges and other structures.

In actual aircraft use, however, these surveying transits had more to them than was necessary. The transit was used to project optical lines with extreme accuracy, but only rarely was the determination or establishment of angular measurements required. The horizontal and vertical circles with their graduated verniers, rudimentary to the survey, now became quite unnecessary in aircraft tooling.

A member of the Douglas Aircraft Company's tooling department suggested developing an instrument for the purpose of extending optical lines without the now unnecessary graduated circles. The mechanics of the problem were worked out through the co-operation of Surveyors Service Company of Los Angeles.

A. I. Hall, originator of the idea (then a member of the Douglas Aircraft tooling department, now a member of the U. S. Army Engineer Corps somewhere in England), and George A. Greenewald, of the Surveyors Service Company, together built the

first experimental "aircraft transit" from parts of old surveying instruments.

It was built up from a transit socket, lower clamp and tangent, top plate and "U" standard from one instrument, and a telescope with clamp and tangent from another. A circular level, later found impractical, was mounted in the center of the standard as an experiment to see if a sensitive circular level could take the place of the two levels customarily mounted at right angles.

The transit top plate was cut down, the vernier openings removed, and a special tapered spindle of larger diameter was fastened to it and made to revolve in the tapered socket of the leveling head. A foot plate from a leveling instrument was used.

So the plant suggestion materialized. Inasmuch as the graduated circles were seldom used, a transit for aircraft tooling could consist of one with a simple center, a single horizontal clamp and tangent, a stable one-piece standard with spirit levels and an excellent telescope with fine cross wires, sensitive spirit level and clamp and tangent motion.

—Douglas Photo.

"Wiggling-in" a large component in a Douglas jig—a new method to control line points with Berger Aircraft Jig Collimators (foreground and right) and a Berger Level (rear). Use of the precision instruments has effected a 500 per cent saving in time.

Time and Costs Saved

With this instrument in aircraft production use, both in making master jigs and in building assembly jigs, the old hand-tailoring methods of collimation have been superseded. The Aircraft Jig Collimator can accomplish quite easily and more accurately the problems of jig construction and inspection than could ever be attained by the piano wire methods of guiding.

When lines must be established with relation to the "center-line" of a complex jig, the Collimator accomplishes the task rapidly and with little effort by a process of "wiggling-in" the instrument on the "center-line" using the lateral adjuster. (This is a device on which the Collimator rests, which can be adjusted to move the Collimator laterally in a horizontal plane.)

Once a straight line is established with reference to the "center-line" and the cross wires of the instrument, other points on the jig may be located with reference to this extended center-line quickly and accurately. The manual labor of adjusting or re-adjusting the piano wire guides for inspection or correction is completely eliminated. By using the Collimator the structure can be re-leveled, changed and checked if necessary, and inspected anywhere and at any time.

As far as the various uses to which instruments are put in any aircraft plant, most every plant has its own specific method. In general, however, they point to the same goal—increased accuracy with a decrease in time to do the job, with its consequent saving in man-hours of labor.

At Northrop Aircraft Corporation, the Jig Collimator was being demonstrated. A fixture that would ordinarily have taken five to six hours to complete and check, using piano wire methods, was completed, inspected and accepted in less than forty-five minutes using the Collimator. This may be translated into an 800 per cent saving in job time alone.

The simplicity of the Collimator's construction means a greater simplicity in use even over transits. There are fewer parts in the Collimator than in the standard engineer's transit, which means a saving in time required in setting it up for work and an even greater saving in time in training the operators. These elements, coupled with its speed in use, result in a saving of time and man-hours of labor all around.

In money-saving terms, in one instance alone, another aircraft plant in Southern California cut the cost of one jig $15,000 by using instruments.

Then, too, without graduated circles and other parts necessary to the engineer's transit, the initial cost of the Collimator is lower. Without sacrificing any accuracy, the capital expenditures for tooling are lowered, and the maintenance expenses consequently less.

When the Jig Collimator was put into production by C. L. Berger and Sons, Inc., of Boston, Massachusetts, manufacturers of precision instruments since 1871, these elements were kept in mind. As a result, in building the Collimators, two essential requirements were kept foremost.

First, the Aircraft Collimator (and levels used in aircraft work) must have extremely well fitted centers. Aircraftsmen work to such close tolerances, .001 inch to .0015 inch in 60 to 70 feet, that the slightest looseness in the centers creates trouble. In the case of both levels and this special aircraft instrument, a tool steel spindle and an annealed iron socket are ideal.

Then, the telescope in these instruments must be unexcelled, with maximum light, power and definition. The platinum cross wires must be extremely fine in order to obtain accurate readings on scales graduated to one-hundredth inches.

By virtue of its applicability and efficient construction, the Aircraft Jig Collimator becomes the answer to the jig builders' and inspectors' problem of establishing optical lines vertically and horizontally with extreme accuracy.

The Jig Collimator is now an established part of production line equipment, not only in aircraft work, but in many other fields of industry.

The Collimator should also be a valuable addition to the equipment in colleges and universities where civil engineering and mechanics are taught, as the students can be shown how to adjust instruments by Collimators in addition to testing them in the field. ★

—(Convair Photo.)

Aviation Writers Association members held part of their 1944 annual meeting in Texas and are shown above on the flight ramp at Consolidated Vultee's Fort Worth factory. There the writers saw a full-scale mock-up of Convair's 400-passenger transport and heard the project engineers explain its gargantuan features.

TEXAS AVIATION WEEK IN REVIEW

Every year the Governor of Texas proclaims Texas Aviation Week, highlighted by a three-day wartime aviation planning conference at Texas A. & M. College, College Station. This year, the week took on special significance with a Dallas-sponsored aircraft and accessories exposition and the annual convention of the Aviation Writers Association, April 28-May 4. Though dogged by rainy weather throughout the week, attendance at the A. & M. conferences surpassed previous registration, while crowds poured into the Exposition tent at Dallas in spite of the mud and high water. The aviation writers were guests of the Materiel Command, Air Service Command and First Troop Carrier Command, the United States Navy at Corpus Christi and Texas aviation companies during their sojourn in Texas. ★ ★ ★

—(All photos, except top above, by Thomas K. Cone, Jr.)

Representatives (above) of fourteen of the twenty-one Latin American republics added international color and atmosphere to Texas Aviation Week activities and signalized Texas' strategic position in inter-American aviation developments. In the center is Miss Carolyn Cassidy of Louisville, Ky., who holds the title of "Miss American Aviation."

Retiring President Wayne W. Parrish (at mike), editor and publisher of American Aviation, turns over reins of the Aviation Writers Association to the incoming president, George Haddaway (center), editor of Southern Flight. At left is Mike Ravinovitch, South American representative of the Guiberson Diesel Engine Company.

Below are, left to right, Bob Morrison of Collier's, Chief Test Pilot Floyd Carlson of Bell Aircraft, Public Relations Director Larry Rowell of Globe Aircraft, and Joseph T. Geuting, Jr., and Frank Christian, General Aircraft Corporation executives, who were among outstanding visitors. Geuting delivered the principal paper at the private flying sessions during the Wartime Aviation Planning Conference at A. & M. College, May 1-3.

World's largest tent housed the Southwest Aircraft and Accessories Exposition in Dallas. Above are interior views. Left: Looking down the north aisle of tent with USAAF Materiel Command exhibit in foreground. The Exposition, sponsored and financed by Dallas citizens under direction of the Chamber of Commerce, will be made an annual affair. Steadham Acker, director of Birmingham's National Air Carnival, guided the Exposition, and Wilson Germany, Dallas private flyer and oil executive, was general chairman. At right is a view of the south aisle, taken above the Navy exhibit. Seventy-five per cent of the space was provided to the military services, while four score commercial companies showed their wares alongside the walls.

Much interest was aroused by the Civil Aeronautics Administration exhibit (left), which included scores of new communicating and traffic control devices and many other modern aids to airmen. Dignitaries at Exposition included those shown below. Left to right are Admiral George Mason, commanding officer of the Corpus Christi Naval Air Station; Josh Lee, member of the Civil Aeronautics Board and principal speaker at the aviation banquet held in conjunction with the Exposition; Lee's son, Josh, Jr., and Tom Braniff, president of Braniff Airways and prominent supporter of aviation activities in the Southwest. At right Lt. Damon R. Elder, USAAF Materiel Command representative from Wright Field, explains a captured German gun from a Messerschmitt 109 to Mayor Woodall Rodgers of Dallas. The Materiel Command exhibit, made up largely of captured enemy equipment, proved the most popular one in the big tent.

Commando Work for Fort Worth

—(Curtiss Photo).

A view of the large nose section of the C-46 Commando, world's largest twin-engined transport. Joined to the fuselage just aft of the pilot's door (behind windows), it will be built by the Globe Aircraft Corp., to complement production at Buffalo, St. Louis, Louisville, and New Orleans.

The Globe Aircraft Corporation, after a year of full production of the AT-10 advanced trainer for the Army Air Forces, has begun manufacture of the nose section for the Curtiss C-46 Commando transport.

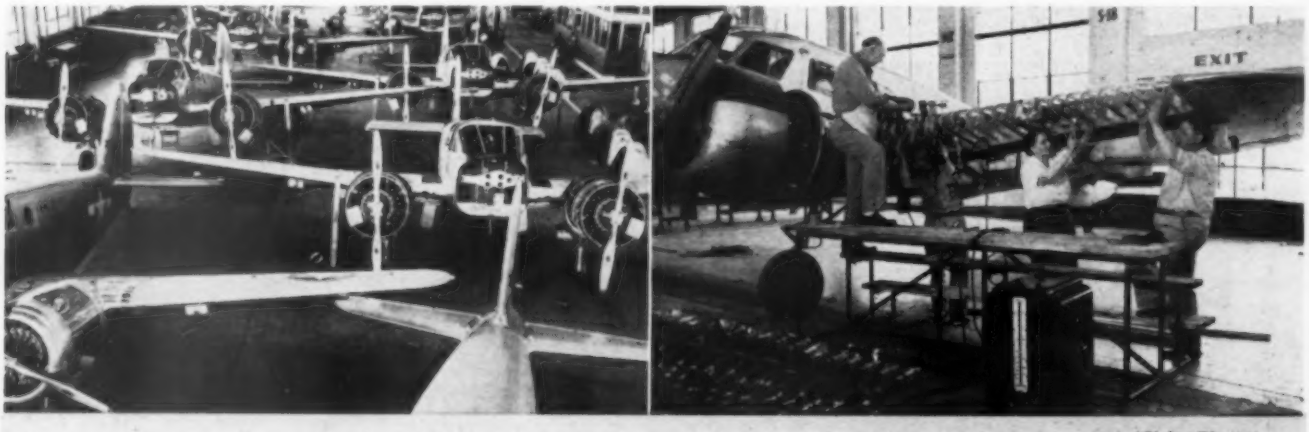
The new assignment for the Fort Worth plant is an "about face", since Globe, depending somewhat on the productivity of subcontractors in the building of the twin-engined trainer, now is placing itself on the very "spot" its subcontractors have occupied. The job of turning out Commando noses also means that Globe must quickly and substantially expand its metal working sections.

In the company's original facilities for the building of the AT-10, woodworking departments represented a big end of the operation. There was not a sufficient number of skilled woodworkers to do the job. Others had to be converted and trained for woodwork. Globe did that, but John Kennedy, president, and his staff, looking ahead to the prospects of metal production, hand-picked them by instructing the personnel department to hire men skilled in metal and who were willing to be converted temporarily for the wood job. So when Globe began to set up the Commando nose project, many of the woodworkers also possessed skill in metalcraft and merely were shifted to metal fabrication.

The Curtiss C-46 Commandos, world's largest twin-engined transport planes, are rolling off the assembly lines of several aircraft factories in an unprecedented production program. Two Curtiss-Wright Airplane Division plants in Buffalo, New York, one in Louisville, Ky., another in St. Louis, and the new Higgins Aircraft plant in New Orleans, La., are participating in the Commando project—largest ever undertaken for the output of transport aircraft. Burdette S. Wright, Curtiss-Wright vice president, recently announced a 250 per cent increase in Commando production had been achieved—and the step-up is continuing apace.

Other new assignments for Globe include a contract for rework on the twin-engined AT-17 trainer, a wing modification already under way in Globe's woodworking section, and substantial contracts for spare parts. The spare parts contracts also are well advanced in production.

The AT-17 rework project is shared by the Cessna plant at Wichita, Kan., and by two of the Air Service Command's maintenance depots. In addition, Globe Aircraft continues the manufacture of spare parts for the AT-10. The firm, fairly new in the field of aircraft manufacture, has come a long way in a rather short time, making a record not only as a prime contractor in the building of airplanes, but also for production as a subcontractor. ★ ★ ★



—(Globe Photos).

These scenes in the Globe factory at Fort Worth show (left) the assembly line for AT-10's, which were produced last year, and (right) a Globe crew reworking the leading edge of a Cessna AT-17. Globe will continue producing spare parts for the AT-10. Note electrical machine and series of foil-covered wooden frames in right hand photo. These are used to apply internal heat for bonding wooden ribs of wing. Globe woodworking shops are among finest in the country.

Most significant contribution to safer take-offs and landings was the development by Douglas of the tricycle landing gear and its use on large aircraft. Thus were the hazards of ground loops and noseovers eliminated.

Adapted to the Douglas Dolphin in 1936, the tricycle gear was next used on the mammoth B-19, the DB-7 Boston, the A-20 Havoc, the DC-4 and the C-54 transports.

Altho an independent development by Douglas, full engineering data on tricycle gears was available to other manufacturers, resulting in safer take-off and landing characteristics for many planes.

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RAMBLING RADIUS OF ACTION

(Continued from page 31)

There, then, is the dope for the trip outward into the blue. Just for practice now, we'll work out the trip back. You will note, at this point, one of the shining features of the E6-B. Once you have plotted the wind (as in Fig. 5) the balance of the problems can be worked by merely rotating the window — assuming, of course, that the wind does not change.

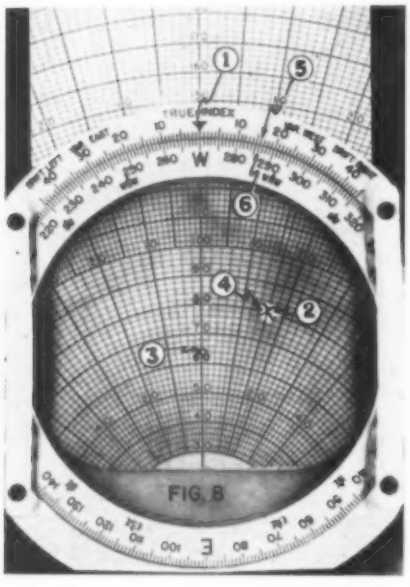

FIG. 8

1. Our course back is 270. Rotate window to put 270 (West) under the true index.
2. Slide slider to put airspeed curve (80) on the same pencil cross you made in Fig. 5.
3. Read 64 mph ground speed on center dot.
4. Read drift correction 16 degrees on slanting lines.
5. Pencil mark is now on right, so on top right edge of computer locate 16.
6. Under it, read 286 degrees TRUE HEADING.

There's the whole first part of this chapter (covered by figures 1 to 4 in the graphic solution) solved on our computer with *One Mark of the Pencil!* How are we doin'?

That still leaves that formula to worry about, though. However, several of my slide-rule whiz compadres got me around that one by showing me this slick method wherein, *after making one setting only* on the reverse side, you have all the answers.

I think you'll agree that this stunt is well worth the price of admission to SOUTHERN FLIGHT's tent. May I suggest that after following through once you go over it several times? Then it'll be as clear as a GI's intentions on furlough.

Only one small mathematical operation is required of you: add the ground speed out (89) to the ground speed back (64) and find 153. Remember, the sum of G/S out plus G/S back is all the arithmetic you need to do. Turn your computer over to the time-speed-distance side (opposite side to window).

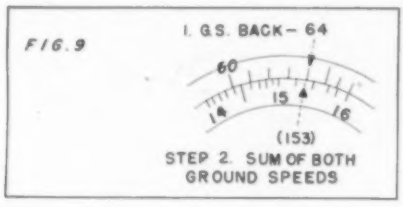

FIG. 9

1. Locate the ground speed BACK (64) on the outside scale.
2. Set the sum G/S out plus G/S back (153) under the 64.

This completes all necessary settings.

DO NOT MOVE THE DIAL FOR THE REST OF THE SOLUTIONS.

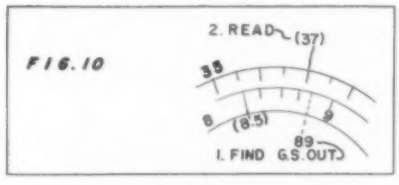

FIG. 10

TO FIND DISTANCE OUT TO TURN:

1. Locate the ground speed OUT on the *inner* scale. (89)
2. Above it read on outer scale 37 plus a little. Since the next mark is .5, we can approximate the setting as 37.2. This is MILES out before turning for one hour's fuel.

Since we have six hours fuel, 6 times 37.2 miles gives us 223.2 miles total distance out before turning back. (For most purposes multiplying 37 by 6 would be close enough).

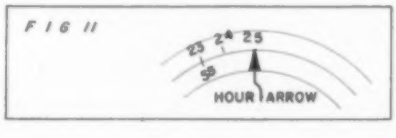

FIG. 11

TO FIND TIME TO TURN:

Again, do not change dial from the first setting. All the answers were cooked up when you made the figure 9 setting.

1. Above the large hour arrow on inner dial.
2. Read 25 on outside scale.

Alas, dear customers, I must disillusion you for this one time. In all previous chapters I have stressed the fact that *miles* are always on the *outside* scale.

This right here is the exception. You're reading the outside scale all right in Fig. 11 but this time AND THIS TIME ONLY she ain't miles on the outer scale. She's minutes.

So opposite the hour arrow read 25 minutes. This is your radius of action (your flying time out) for one hour's gas. Since we have six hours gas supply we can fly six times 25 minutes out and still get home.

So 25 times 6 gives 150 MINUTES or two hours and 30 minutes out before turning back.

Just to make up for getting somewhat technical above, here's how to find the time to turn without multiplication.

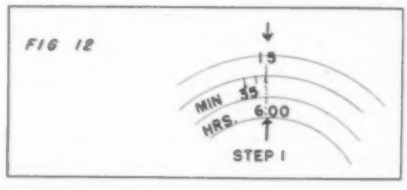

FIG. 12

1. Again without moving anything, locate six hours on the *inner inner* scale.
2. Opposite it, on the outside scale read 15.

Obviously with six hours gas, your radius of action would be more than 15 minutes so it must be 150 minutes which equals 2 hours and 30 minutes.

Well, there you are, computer twisters, Radius of Action solved with one pencil mark, one simple addition and one setting of the clever little backside of the E6-B.

Next session we'll be back with some more E6-B tricks. I would suggest, dear customers, that you dig out some old navigation books (which have the answers) and try other radius of action problems to show off your new found knowledge.

Some day it may pay dividends if you keep radius of action solutions well greased on your computers.

★ ★ ★

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HINTS BEFORE USING: Do not remove plugs from their hermetically-sealed packages until needed.

Store new and reconditioned plugs in a clean, dry place to prevent moisture penetration.

HINTS ON INSTALLING: Be sure plug inserts in cylinders are in good condition, and free from carbon and foreign matter.

Use proper tools. A six-point Hex deep socket wrench with eight-inch handle is recommended.

Avoid excessive tightening. Correct torque, 45 ft. lbs.

When attaching ignition lead terminal to shielded type plug, insert terminal so as to avoid scraping the mica winding inside shielding tube.

HINTS ON SERVICING: Don't discard old plugs. Return them to the factory, Simmonds-Benton Manufacturing Division, Vergennes, Vermont. Complete factory reconditioning is available at nominal cost. For further suggestions, write for free Simmonds Spark Plug Service Manual.

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A Preface to POSTWAR PLANNING

Part V—Airports and Landing Fields

Closer co-ordination of local, state and Federal airport programs and greater emphasis on low-cost facilities must be achieved if hopes for healthy postwar expansion are to be realized.

By GEORGE E. HADDAWAY

THERE'S at least one fundamental point all airport planners, promoters and dreamers agree on: we need more airports and landing facilities, simply because any future expansion of civil aviation will be in direct proportion to the number and kind provided. John Q. Public must be able to fly to and from a lot more places with far less inconvenience and cost than is possible today; and whether you're talking about legislation, regulation, technical improvements, safety, maintenance facilities, or, as in this case, airports, it all boils down to creating a higher degree of utility.

From that point on the argument starts. How many airports do we need? What kind? Where should they be located? How much will they cost? Who should foot the bill?

A great many proposals for a national airport program look good on paper and "listen good," but when analyzed under the light of all the physical and technical factors involved, prove out impractical and unsound. In our opinion, the campaign for the construction of some 20,000 landing strips at ten-mile intervals over the entire country at a cost of one hundred million dollars is just such a proposal. Proponents of this program, who define air strips as "a level grassy piece of land 150 to 200 feet wide and 1,500 to 2,000 feet in length," fail to realize it's physically impossible to divide the country up into ten-mile squares and put a landing field at each intersection because such obstacles as mountains, forests, cities, rivers and lakes would have to be removed to achieve their goal.

The "strip-tease" artists also fail to grasp the importance of building landing facilities *where people want to go.* They simply want to build landing strips in a nice artistic pattern so that the pilot can land anywhere within a ten-mile radius without any thought of utility, or of making towns and recreational centers more accessible. Too often, the inference is left that in case of forced landings, such a system would guarantee an airport that could easily be reached from any spot in the sky.

Back in the twenties when forced landings were common, there would have been some argument along this line. But today, this hazard is negligible and should be reduced even more impressively as aeronautical science progresses. Finally, our criticism of the landing-strip school is offered in the matter of field layout. We realize that the day is probably not far off when airplanes will be able to land and take off on a one-runway field irrespective of wind velocity and direction. But that's not true today and it's still a matter of conjecture as to when full-swivelling landing gear and other wind correction devices will be in universal use. So our landing fields will need more than a one-way strip. Two runways at right angles or the familiar "L" and "T" shapes, permitting landings and take-offs into four points of the compass, is a more practical design because it takes into consideration the limitations and requirements of conventional airplanes.

Another school of strip enthusiasts want to build them alongside principal highways. There are many locations where landing facilities are sorely needed and it would be logical to construct them next to hardsurfaced roads that lead to town. But don't forget that when a pilot flies from Point A to Point B, he flies a direct course and probably wouldn't change it to conform to a circuitous road no matter how many landing strips were located thereon. It's the old utility thing again. If we're going to have to use public roads as airpaths, we might as well sell our airplane and get a good fast automobile.

There are about 6,700 towns in the United States with 1,000 or more population. All of these towns should have small, low-cost landing fields capable of serving personal aircraft —airports in the CAA Class I and Class II category. Some 2,000 of these same towns have upwards of 10,000 population. Larger facilities, perhaps in the Class III and Class IV airport classification, should be provided for them. Such a program would do more than any other single effort toward providing the services, speed and utility of aviation for *all the people.*

This, in brief, covers the utilitarian aspects of airport development—build airports where people want to go, where people live and do business. Augment this program with scientifically located emergency fields over dangerous terrain or unpopulated districts and develop adequate landings and service facilities near the great recreational centers where the airplane owner can fly to spend a pleasant weekend or annual vacation in full enjoyment of his favorite sport. Many resorts might well construct their own fields on their own initiative from purely a business standpoint.

To us, such a program makes far more sense than the plan to build a single runway landing strip every ten miles across the length and breadth of the land. It would be far wiser to have 10,000 landing fields constructed on the basis of utility, population, necessity and potential development than to have twice that number scattered from hell to breakfast simply for eliminating the forced landing hazard, now negligible, or for people who can't navigate.

What Kind?

The Assistant Secretary of Commerce for Air, William A. M. Burden, recently revealed that the CAA national plan is now nearing completion.

(Continued on page 42)

R-301 the ALUMINUM ALLOY

that has both STRENGTH and RESILIENCY

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R-301 is the first high-strength aluminum alloy that has a hard core as well as a tough surface cladding . . . with a corrosion resistance almost as good as 99.5% aluminum! The cladding is more homogeneous in relation to the core, and this adds still other important advantages—higher bearing, shear, yield and fatigue strengths.

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POSTWAR PLANNING

(Continued from page 40)

It calls for the construction of nearly 3,000 new airports, of which little more than 100 will be larger than Class II, and the enlargement of roughly 600. This is exclusive of some of the metropolitan areas, plans for which are not complete at the present time. The plan will call for increasing the number of Class I and II airports (private flying fields) from roughly 2,000 to 4,600. The larger Class III and IV airports will be increased to 600 and to 700 respectively. This program will give the United States about 6,000 airports, or twice the number we now have.

Note that emphasis in the above plan is on relatively small airports in Class I and Class II categories, which will be more than doubled. It's a mighty healthy sign for the postwar outlook that our civil aviation officials anticipate and are wisely preparing for a tremendous upsurge in private flying. In commenting on the subject recently, Burden had this to say: "The construction of a comprehensive and intelligently planned system of landing facilities is as essential to the growth of private flying as the development of our system of roads was to the expansion of the passenger automobile industry . . . Federal assistance for the construction of airfields for the private flyer is, in my opinion, advisable and justifiable and I hope that Congress will take the same view when it considers the matter of legislation for a long-term program of civil airport construction." It has been pointed out for many years that inaccessibility of airports ranks second only to items of cost among reasons why people give up flying. And the number who quit is alarmingly high.

It's impossible to compliment our Civil Aeronautics Administration leadership too highly for their recent interest in and acknowledgment of private flying problems, particularly as regards the urgency for adequate landing facilities. Not that we would minimize the necessity for more and better accommodations for scheduled operations but from a numerical as well as a cost standpoint it is logical to insist upon a ratio upwards of ten to fifteen small airports for one "master" airport capable of handling large military and transport operations.

Estimates vary regarding the number of airplanes we'll be flying within a few years after the end of the war. They run from 250,000 to 500,000 privately owned craft and 1,000 to 3,000 transport airplanes. In the light of these estimates, which come from reliable sources, there can be little doubt as to what kind of airports should comprise the major portion of our national airport construction and development program. Communities and states who remain blind to this inevitable trend and fail to make allowance for it when purchasing land and making their postwar airport plans, will pay and pay dearly in the years to come. We have already seen millions of dollars wasted and lost forever by communities through lack of vision and planning during the years gone by. Some of the larger cities failed to make their transport airports and terminal facilities large enough. They constructed their fields on the wrong locations. They completely lost sight of zoning and failed to purchase additional acreage that would permit expansion.

—Cessna Aircraft Co. Photo.

DOWNTOWN AIRPORT: Many cities could build airports right on their "front porch" as shown in this proposed field for Wichita, Kansas. The artist has cleverly superimposed a "downtown" airport on available property within a stone's throw of the business district. Proponents of this plan point to abandoned railroad yards, wornout industrial and slum districts that could be transformed easily into landing fields within the heart of a city.

Every community ambitious for a place on the aviation map might well profit from these costly experiences and start now on progressive and intelligent airport planning, mustering all the technical and expert advice and direction available. This local planning, if begun now with the impetus that local initiative alone can give it, may be geared easily into the national plan under the supervision of the Civil Aeronautics Administration. States that do not have aviation departments should pass enabling legislation that would permit co-ordination with and financial participation in the Federal program.

Plan and Formula

Charles I. Stanton, CAA Administrator, has pointed out that the Federal and state governments should become partners in building the nation's postwar civil airports system in general accord with principles worked out in building our national highway system — admittedly the best in the world. He states: "If the President and Congress authorize a Federal aid airport program, funds could be apportioned to the states by the CAA upon the basis of some accepted formula. This formula should take account of four factors — (1) the area, (2) population, (3) number of registered aircraft, and (4) the existing number of accredited airports in each state. As in the Federal highway system, each state would have to match a specified percentage of its share of Federal funds."

If this nation is to build and develop a sound and adequate system of airports to serve public convenience and necessity, Federal, state and local airport planning must be co-ordinated and synchronized into the master national program. The only storehouse of expert technical airport personnel in any quantity available to all the people is now connected with the Civil Aeronautics Administration. This personnel didn't just happen—it came up through the years.

But in emphasizing the importance of national direction of our postwar airport program, let us not forget that without local or community initiative, it is doomed to either partial success or even complete failure. There are hundreds of towns and even cities among the 6,700 with over 1,000 population which lack this all-important ingredient of initiative. The time has come when we must create sufficient interest among the people living in our aviation saharas and plant

(Continued on page 44)

TWO OR FOUR PLACE?

Write your own Ticket...

WE'LL BUILD THE POST-WAR PLANE YOU WANT!

WE intend to plan our Bellanca planes for post-war tomorrow according to *your* ideas of what *you* will prefer to fly as pilot—or fly *in* as passenger. And so we've listed a number of questions, which seem to us pretty fundamental, in our Aircraft Quiz.

Make no mistake about it, we're placing first things first. We're doing our share to win the war. Work at the Bellanca plants has been devoted to building the twin-engined AT-21-BL crew trainer, as well as vital Army Air Forces warplanes armament and components. Like yourself, we've gone all-out for Victory. But we're also planning for your *peacetime* needs.

Our Aircraft Quiz has brought out the views and opinions of thousands who are looking ahead to post-war flying. This Quiz covers many important features in the design, construction and economical operation of tomorrow's private planes. It goes into speeds, range, weights, and loads—flight characteristics—types of construction — your personal experience in flying—and many other questions that will help you in choosing the aircraft best suited to your peacetime plans. And these questions are so arranged that you can quickly check them off—*Yes* or *No!* Then, later, we'll send you the score-card of this Quiz.

You'll find the Quiz most interesting. Possibly it will help you to clear your own thinking. And your answers will help at least one aircraft builder to supply the kind of peacetime plane *you* want. So—send us your name and address today and we'll mail the Aircraft Quiz promptly.... Bellanca Aircraft Corporation, Dept. S-8, New Castle, Delaware.

BELLANCA

Keep on Buying
U. S. WAR BONDS

POSTWAR PLANNING

(Continued from page 42)

the seeds of desire to have a modest, well planned airport when the money and labor are available. Education, therefore, is one of the elements in the mass of advance planning that must be done.

Congress must be urged to study our postwar airport requirements and prepare the way for legislation and appropriations that can start the wheels turning immediately after the armistice. A national airport program would provide a splendid cushion for re-employment during the transition between war economy and peace. Everybody would stand to gain; the taxpayers because they would get their money's worth and a high return on the original investment on building facilities for a new source of revenue as well as improving transportation facilities into their community; the national economy because in such a program most of the money goes out in wages; the aviation industry, because the facilities developed would provide the bedrock for making aviation available to all of the people, thereby creating the long-sought mass market for aeronautical products and services; the nation itself, because a strong new industry would be born to lead America out of the rubble and wreckage of total war into a new age of peace and richer national development, as history teaches us has happened before. ★ ★ ★

JUST AMONG OURSELVES

(Continued from page 10)

the Northwest Airlines tax case as a new peg to hang an old hat on, President Gorrell would revive the Lea Bill and cram it down the throats of thousands of airmen off fighting this war who, when peace comes and they return home, would find the air under such tight control of vested interests they could never hope to engage in flying enterprises except on the payroll of the transport monopoly.

Mr. Gorrell, in commenting on the Minnesota tax case, states: "The Lea Aviation Bill, with rare foresight, contains a provision calling for consultation between the Civil Aeronautics Commission and proper State authorities with a view toward eliminating and avoiding multiple taxation of air commerce. Under the bill the Commission is required to report to Congress as soon as possible the results of its study, together with recommendations. Hearings on the Lea Bill were completed many months ago, and the bill has been blocked in the Rules Committee of the House of Representatives for more than five months."

It seems to us that Mr. Gorrell could have seen the light long before now and instead of trying to revive a controversial bill, condemned and cast out months ago, would pitch in with the rest of the boys and work out the common legislative problem on common ground. But Mr. Gorrell doesn't want to co-operate with other phases of aviation. To him the Lea abortion is all-holy, the only road to intelligent aviation legislation.

It would be far better for all concerned, including the Air Transport Association, if the airlines' trade association jumped down from its high and mighty throne and mixed a little with the common herd, met with them and approached the all-inclusive complex problems of aviation legislation in a co-operative spirit. The problem of multiple taxation of the air transport industry is just one of many. And it's about the weakest excuse we have heard to date for reviving a vicious piece of legislation conceived, written and almost passed into law by the airline lobby. ★ ★ ★

HOW LLANO BUILT AN AIRPORT

HERE is proof positive you don't need a million bucks or a bond issue to build an airport:

Deep in the heart of the central Texas hill country, where ranching and granite quarrying are the principal industries, it's a long time between landing fields. Forced landings usually end up in tragedy because of the rough terrain.

Shortly after war broke out and Texas became the air training center of the nation, Llano County's 6,000 citizens suddenly became aware of the churning props on the Army ships from nearby bases. There wasn't an airport—not even an emergency field—in the entire county. After six students were killed in the area as a result of forced landings, three citizens, Carl Garner, owner of the picture show; Carlos Ashley, president of the Chamber of Commerce, and Dr. Ray Shepperd, prominent physician, began looking about as a self-appointed committee seeking ways and means to provide some sort of an airport.

The news got out and soon they were met with an offer from a firm of contractors, McKown & Sons, who had built many of the highways within the county: If Llano would furnish the land, they would build an airport meeting CAA specifications—at no cost to the taxpayers.

A tract of more than 200 acres appeared ideal to the planners. With other ranchers and business men helping as solicitors, they went from house to house throughout the countryside. In a few days they had $22,500 in cash, donated by citizens. Through the Commissioners' Court the land was acquired for that amount. Joe Bland, formerly of Llano and now in Army airfield construction, came home to volunteer the necessary engineering work. The contractors went to work, removing great amounts of cedar and live oak brush, moving 160,000 yards of dirt, and scraping out two runways about 4,000 feet long and 500 feet wide. The site is 1½ miles north of town.

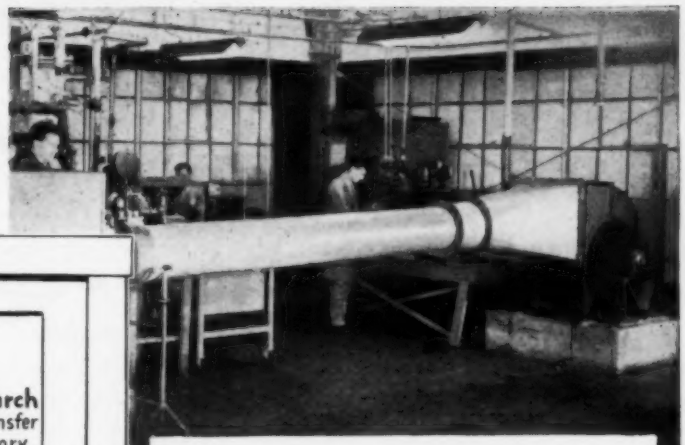
Now Army Wants Use of Field

CAA District Airport Engineer C. L. Willis and other officials of the regional CAA office at Fort Worth gave every advisory assistance possible, with Willis spending more time at Llano than anywhere else. When they had finished, they pronounced the airport runways excellent, the decomposed granite that forms the base being the finest base material known. The contractor has offered to apply a seal-coat or cut-back asphalt topping, 150 feet wide, on each runway for the cost of the material alone. He has been deeded fifteen acres of adjoining land and hopes to use the acreage after the war for his own repair shop, parts department and machinery storage, permitting company airplanes to utilize the airport for hauling parts and expediting repairs when road-building machinery breaks down anywhere in the Southwest.

Llano folks—all 6,000 of them—are mighty proud of their airport. Three Army planes landed on it within a few weeks. One was a C-47 of the Troop Carrier Command, and officers of that Command's base at Austin, Texas, have said they would like to use it in connection with training activities. Although there's not a single civilian plane or pilot in the whole county, Llano citizens say they want it ready for their boys to use when the war is over.

Not every town and county in the nation will have the vision and pride that Llano has. But if a county of only 6,000 can build a creditable airport during wartime, without a penny of subsidy from the government, it stands to reason that hundreds of other communities might follow this amazing precedent.

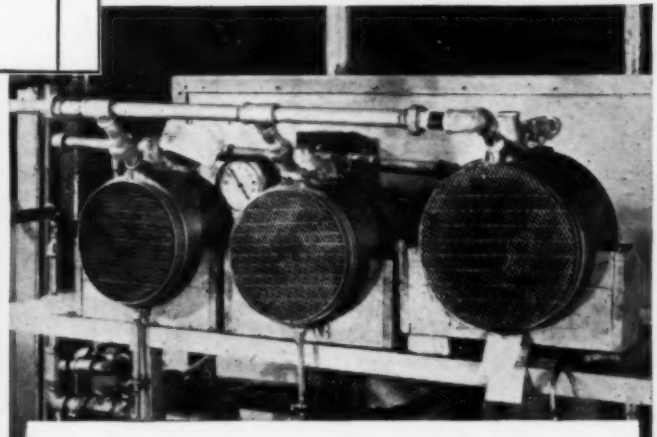
This is the way to improved Oil Cooling



HERE'S THE HOT TUNNEL where oil cooler designs are tested under conditions similar to flight. It creates air flow equal to speeds met in flying . . . circulates hot oil through the cooler . . . weighs the oil flow to determine cooling efficiency. By such tests, AiResearch has been able to perfect oil coolers that are *lighter-weight* yet provide greater cooling efficiency per square foot.

THIS IS THE REFRIGERATED TUNNEL which puts oil cooler designs through the same kind of rigid testing—but under temperatures as low as –90° F.!

These experiments have brought forth numerous anti-congealing developments. The latest is AiResearch "FREE FLOW" oil cooler that *resists congealing* even in the most extreme high-altitude colds.



. . . **AND THE CYCLING EQUIPMENT** for life-testing. Each oil cooler design must stand up under 60 lbs. psi steam pressure applied 50,000 times!

It's here that AiResearch proved the ruggedness of their elliptical oil cooler design—the first ever built to withstand such terrific pressure.

IMPROVING HEAT TRANSFER EQUIPMENT is a specialized project at AiResearch. Continued research here is bringing forth many new developments in heating and intercooling as well as oil cooling. Information is available now to you who are building today's—and planning tomorrow's—aircraft.

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Engine Oil Cooling Systems • Engine Air Intercooling Systems • Supercharger Aftercooling Systems

THE Sky's the Limit

BY BILL GREEN

Looking over postwar questionnaires. . . . People want lots, but paying for it will be something else. . . . Youngsters need pilots' advice on airplane handling. . . . A letter from Charlie Short's boy. . . . Endorsement of CAA inspection.

Private Plane of the Future

LATELY, we have received a number of inquiries from the various airplane manufacturers as well as from some of the airlines regarding the kind of airplane we would like after the war, and the kind of airline service we feel would be most desirable.

I often think it would be a good idea to send to all these airplane companies and airlines some sort of questionnaire regarding what kind of pilots they would like to have for their planes, and what kind of passengers for the airlines.

When you get down to brass tacks we have always had better airplanes than we have had pilots, and we have had better airline service than we have had patrons.

An analysis of the last several accidents reported by the CAA indicated 100 per cent pilot errors and no airplane failure. Of course, it might be possible for the airplane companies to make the airplanes think for the individual, but in practically every case the pilots control could be made to over-ride the plane's thinking ability and he would kill himself and his passenger anyway. It might be possible to keep airplanes from doing something funny when they were slowed down to the stall point, but that still wouldn't keep people from flying into bad weather, falling into ravines, trees, houses, highlines, etc.

The questions asked by the manufacturers, however, are all encompassing in scope, hence they want to know what horsepower, what cruising speed, how much gas capacity, how much passenger capacity, how much cruising range, what kind of propeller, whether steel tubing or wood or metal construction for fuselage and wings, how many instruments, what kind of landing gear, and finally, how much it should cost. We would like very much to be able to see the results of a nation-wide survey. We will bet that people will require every conceivable convenience, instrument, horsepower and everything else for a very small price.

Cost will control the growth of aviation after the war. From all accounts it probably will be necessary to reduce working hours in this country to thirty hours per week per individual, or perhaps even lower. With the present income rate applied by the hour to a reduced number of hours, individuals now making several hundred dollars per month would make less than $150.00 per month. Such individuals could not afford to pay extremely high prices for anything, and therefore it would be impossible to increase their hourly rate because that would require an increase in hourly rates all over the country, and therefore the cost of everything would go up. It is inconceivable that prices could go up while total income would go down. People would not be able to buy the high priced items.

This means to us, then, that the airplane of the future should definitely be a low initial cost and a low operating cost machine. That probably limits it to two-place airplanes with small engines.

Incidentally, this two-place small engine airplane has already been given a pretty good trial and some of them are really first class aircraft. While we believe there are a number of improvements desirable on the Culver, we have had two of them now, and there is no doubt that the combination of speed and economy, practicable in the Culver, is as good as or perhaps better than most other small aircraft.

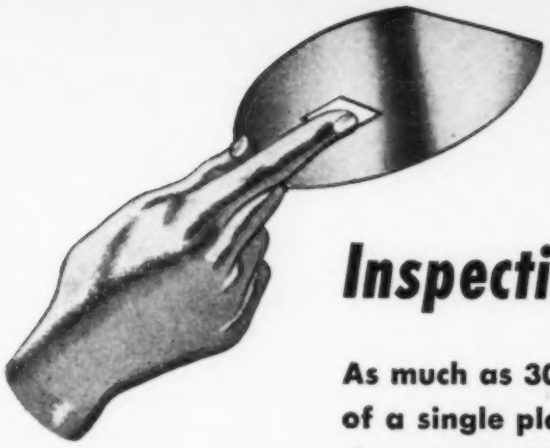
It is interesting that the other day we went to an aviation meeting in another city and arrived very early in the morning. In fact, we were the first to arrive. The reception committee remarked upon our short landing and also remarked that they had never seen a Culver slip into a field before. As far as we are concerned the Culver slips like every other airplane and can be handled beautifully that way. Since we learned to fly and make approaches by slipping, we prefer to slip many times even when using flaps. We stood around for forty-five minutes, during which time about ten other aircraft came in, all small except one, and in every case, although they came over the fence about the same altitude we did, they rolled two to three hundred feet farther. During the conversation, we were told by several people that nobody but an expert could fly one of these jalopies, and we ascertained that in each case the person alleging had never flown a Culver.

Many aircraft have reputations for being hot simply because some of the people who were killed in them were not capable of flying any kind of aircraft, no matter what it might be. We have had thirteen different airplanes running the gamut from forty-five hundred pounds down to about eight hundred pounds with engines from eight horsepower to four-hundred and fifty horsepower, and surprisingly enough have found that practically every one of them landed within 20 per cent of the landing speed of the slowest one and that all of them could be brought into the same size field and take off from the same size field. We have to make the statement that we are not a good pilot anyway, as we frequently have to go around again and sometimes have been lost, many miles off course.

Helpful Hints Needed

We think that much good could be done for the average young pilot if some agency such as the CAA would publish a bulletin on the handling characteristics of various aircraft. CAA personnel is composed of a good many very high-class and capable pilots, some of whom would undoubtedly have the rare combination of engineering analysis, plus the ability to write it down in an interesting fashion. We have frequently heard old time pilots give dissertations upon the methods of flying certain aircraft and we have known a few pilots who could get into any strange airplane and feel it out for a few minutes and

(Continued on page 48)



PRESS and the Inspection Door Flies Open

As much as 30 minutes is saved in the inspection of a single plane by the *new Hartwell inspection door latch.* That means planes in action faster!

APPROVED BY ARMY AIR FORCES

Part No. H-4525
Patent applied for

The new Hartwell inspection door latch ends the slow, tedious removal and replacement of inspection doors. Simple and rugged in construction, it contains four parts—trigger and bolt, made of light gauge steel, aluminum bracket, and twin springs (two are used for safety). It is light—weighs less than ⅓ oz.; rivets to the inspection door, and it *fits flush!*

Press the trigger of the Hartwell latch and the inspection door pops open! Press the bolt and it is locked shut! Two or more latches may be used on a single door, if desired. This inspection time-saver can be installed in a standard Army Air Forces cutout, shown on print 43G2853.

New flush hinge. Available with the new Hartwell inspection door latch is the new flush hinge. It is light and durable. Holds the inspection door to 30 degrees of full opening when it is released by latch. *For complete engineering details about latch and hinge write or wire our Los Angeles office.*

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SKY'S THE LIMIT

(Continued from page 46)

make a normal, perfect landing the first time.

If such a book could be written by the CAA and published for seventy-five cents or a dollar, provided that it was fair to all aircraft, we believe it would be a great help to manufacturers and to pilots. We know that there is a way to handle and fly each aircraft safely and to obtain the maximum response and performance. As a small example, we might cite a fact that most people flying around over the country will permit the airplane to get into a slight climb which slows it down some and they will keep it in a slightly climbing attitude from one end of the trip to the other, never having obtained the last five to ten miles per hour of cruising speed from it.

We have noticed particularly that in gusty air, without changing the throttle setting at all, the airplane will gradually be slowed down about ten miles per hour without gaining altitude. On the other hand, if the nose is put down a little bit and held until speed picks up and if it is pushed down in each gust it will be possible to maintain the full cruising speed without changing the throttle setting and without losing altitude. That was an old racing trick known by most of the race pilots and it worked. If the proposed CAA book contained a list of tricks for getting the best advantage from the different kind of ships with a lot of general dope on how to actually fly to the best advantage, we believe this would tremendously aid private aviation. Incidentally, some of the airline pilots could afford to buy one also.

Airmen's Calendar

June 14-16—Short course and conference on airport facilities and management, A. & M. College, College Station, Texas.

June 17-18—Air Traffic Conference, Denver.

June 23-24—Officers and directors meeting, Aviation Distributors and Manufacturers Association, Edgewater Beach Hotel, Chicago.

June 26—West Virginia Aviation Planning Forum, Charleston.

July 10-12—Annual meeting American Association of Airport Executives, Sherman Hotel, Chicago.

August 2-3—National Aeronautic Association National Business Meeting, Denver.

Nov. 15-18—Second National Aviation Planning Clinic, Oklahoma City.

The book should be edited by six or eight of the outstanding pilots in the country with a little dissertation from each of them to start it off right.

A War Pilot's Attitude

Not long ago Charlie Short, manager of the world's best airport (Tulsa), went out to Arizona and pinned the pilot wings on his son, Lieutenant Bill Short of the Army Air Forces. Charlie is awfully proud of young Bill and with good reason, as he is a handsome youngster, and as he apparently is wiser than most, inasmuch as he is reported to have said that with all his instrument rating and hours of instructions he still felt like that there was a great deal yet to learn.

Bill wrote the following bit of prose representing his version of the attitude of the Army Air Forces. We feel like this is a wonderful attitude and we hasten to accept these sentiments in the spirit in which they were written. There is no doubt that our Army Air Forces are the greatest fighting team of its kind in the world. We are proud of this attitude and of these pilots and other Air Force personnel. We believe that every American should do his part towards sustaining these wings, these boys, and in fact, the America that they love. Here is Bill Short's speech:

"From the Eastern coast of New York through the lush meadow lands of Kentucky and Virginia; rolling westward through Louisiana and northward toward Chicago. Across the muddy Mississippi into the cool green of the Ozarks, and south above the burnt plains of Texas, Oklahoma, and Kansas; over the snow-capped grandeur of the Rockies, across the reddened deserts of Arizona, and down through the mountain passes of Washington and Oregon — winding ever westward toward the fleeting rays of the setting sun on the blue Pacific into the green golden orange orchards of California, the sons of America are sprouting their wings. Boys who yesterday were intent only upon driving a jalopie to a high school dance are today, burning with a feverish desire to drive a twenty-ton Fortress over Berlin or a 400-mile-an-hour Thunderbolt into a formation of enemy planes. . . . And we, those boys, whom you, America, gave your valleys to roam, your mountains to climb, your winding summer highways, your Drive-Ins, your winter snows, your

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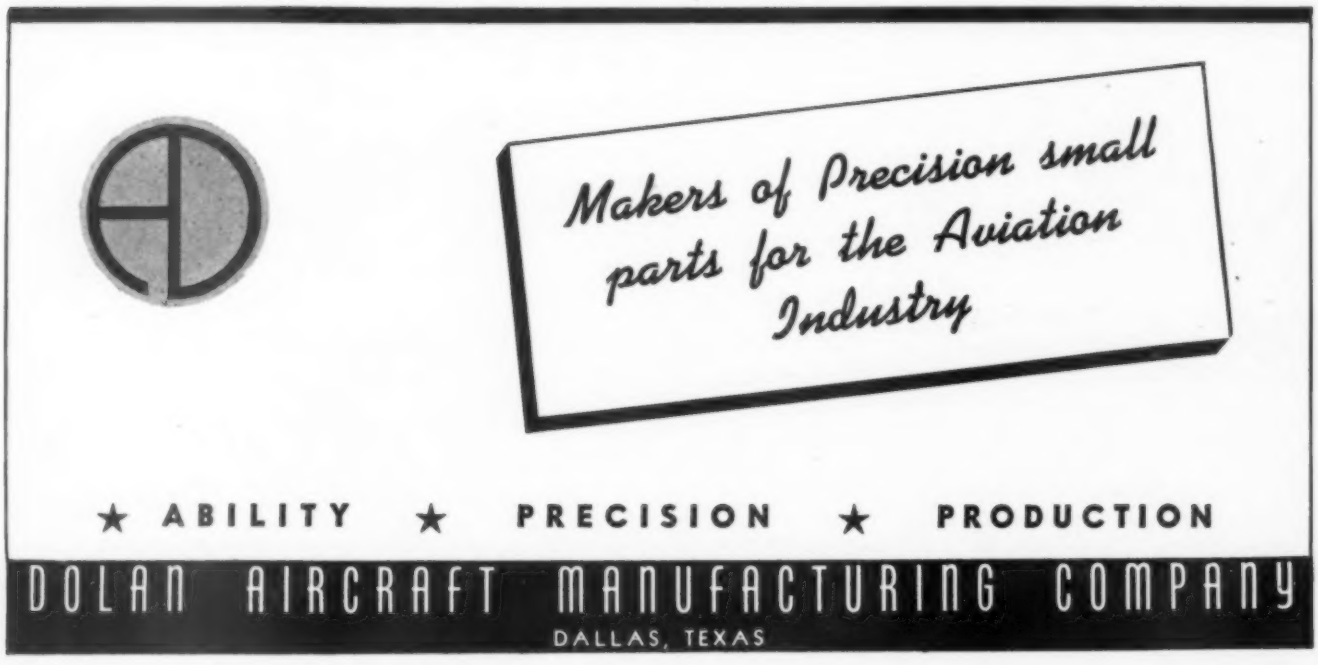
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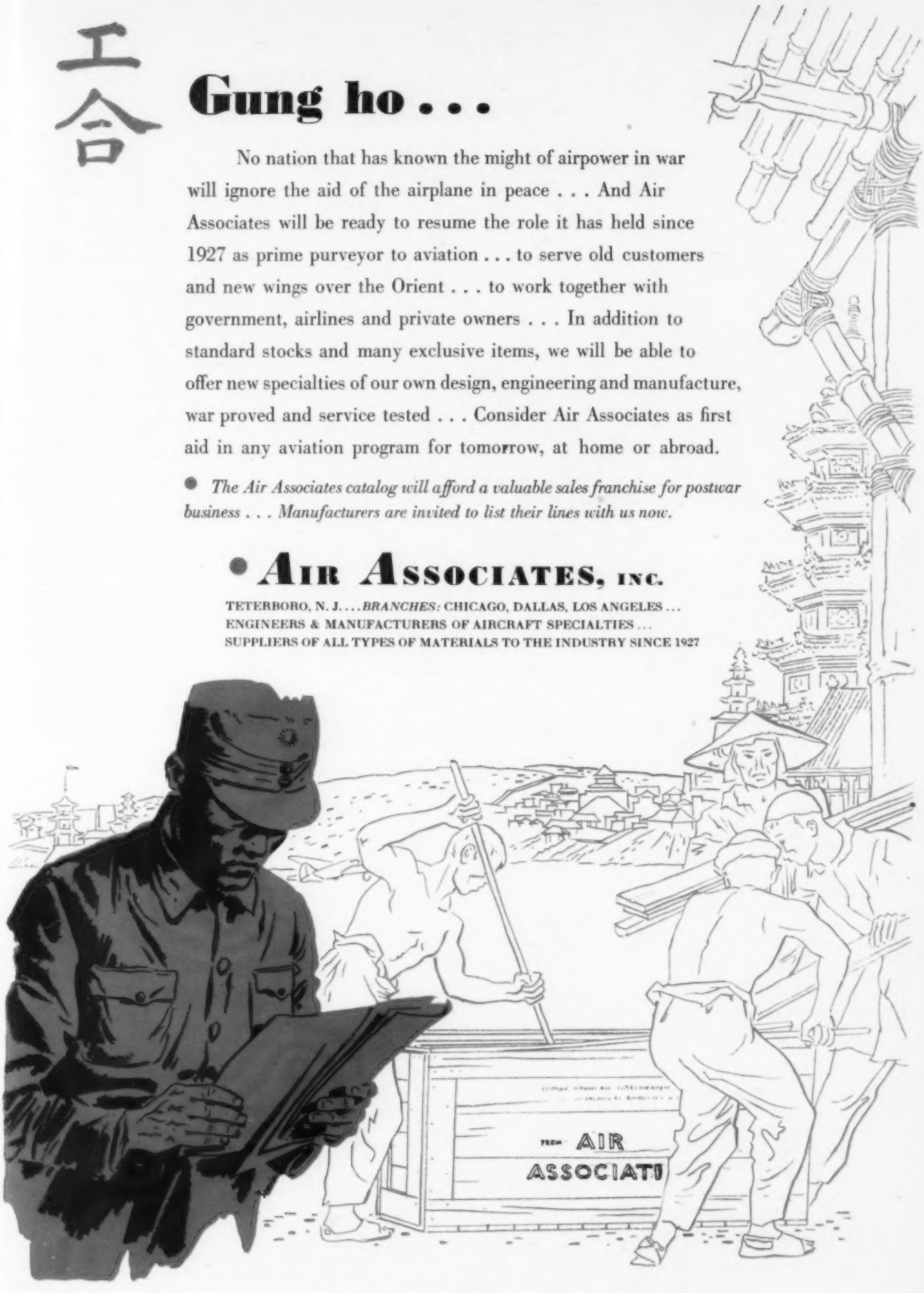
SUPPLIERS OF ALL TYPES OF MATERIALS TO THE INDUSTRY SINCE 1927



SKY'S THE LIMIT

(Continued from page 48)

corner drug stores, your jalopies to drive and your skies of freedom's blue, will avenge you. We, your fighting sons with wings, will crush the mighty impregnable dream of a madman's world of hate, fear and oppression. We, now the men of the United States Army Air Forces, are on our way. . . . The skies ahead are black with smoke, red with flame and hot with the heat of bullets. . . . But through those flaming skies we'll fly and fight, until once again we can return to America and the peace we once knew. . . . Until our force of right destroys the hate and fear so prevalent in the world; 'til the Swastika crashes earthward into a million broken pieces; 'til the yellow sons of Nippon are blown beneath the sea; until savageness, ignorance, pain, tears, blood are only words of the past—we will not rest. To this end we, America, your sons, dedicate our energy, our hope and our lives. . . . We will fly to avenge — we will die to keep men free."

Our Opinion of CAA

In one of the questionnaires we received the other day there was an inquiry with reference to what we thought about the CAA and its regulation of aviation. We know that for years there have been certain people who continually fought against the regulations of the CAA and refused to abide by them. However, we have noticed that those people have steadily diminished in percentage as more and more people have recognized the great service performed by the CAA. The CAA is composed of human beings like the rest of us; in some cases they have been overzealous; however, on the whole, they have rendered exceptionally straightforward service steadily reducing the percentage of accidents; increasing the safety of aircraft, and, in the days of excessive flying in any airport vicinity have managed to issue such instructions as to reduce traffic hazards to a minimum, thereby undoubtedly saving many lives.

We think that from time to time it might be wise to consider the CAA's attitude toward various programs and to advise with them through the proper channels as to any changes in the regulations that we as individuals might deem desirable.

We believe that the CAA's general inspection service has been, without a doubt, thoroughly desirable and acceptable. They have had, of course, to be a little red tapey which has inconvenienced some of us a number of times; however, if they were not red tapey many things undoubtedly would be neglected on different aircraft with the possible result of a serious accident sooner or later. ★ ★ ★

KANSAS CITY LOOKS AHEAD

By RICHARD C. MURRAY

WHERE to, mister?" the taxi driver asks his passenger leaving a downtown Kansas City hotel. "To the airport," the traveller replies, and adds casually, "my plane leaves in fifteen minutes."

The meter registers 45 cents as the taxi pulls up in front of the airport terminal building five minutes later. Uniquely situated only one and one-fourth miles from the business, hotel and industrial districts, the Municipal Airport is one of Kansas City's greatest aviation assets.

Less than five miles by fast boulevard from downtown Kansas City is Fairfax Airport, the municipal airport of Kansas City, Kansas. Although now leased and used exclusively by the Army and Navy, the field is well equipped for varied postwar uses.

Kansas City's third municipal field is the three million dollar Grandview Airport recently completed south of the city. Feeling their way carefully as they go, the city's leaders envision Grandview as a great air cargo terminal and auxiliary air passenger field.

With improved instrumentation and traffic control, it is expected that these three airports will handle the hundreds of daily landings and takeoffs of the great transcontinental airlines, the feeder and locally scheduled planes and the military operations of peacetime aviation. A network of smaller airports will furnish landing facilities for the greatly increased numbers of light aircraft which will be sold and used in the Kansas City area.

Two of the country's domestic airlines have their home offices in Kansas City. Two other airlines serve the city with important routes. Sixty-six daily airline takeoffs and landings are now scheduled at Municipal Airport. This traffic will have a virtual mushroom growth as aircraft are added to the airlines' fleets, so that the routes can be built up to their full potentials and other new routes are added.

A glimpse of what may be expected is provided by the 115 air routes listed in applications of forty-two companies, each of which proposes new services to link additional towns and cities by air with Kansas City. Eight of the sixteen domestic carriers are included in these forty-two applicants. With Kansas City's geographic location in the heart of the nation, its manufacturing, wholesaling and distributing business built on transportation, and a tremendous trade territory, the local and feeder air routes should find a profitable market and rapid growth in the Kansas City area.

Keeping Up With Private Flying

Taking the cover off the crystal ball to look at future private flying, Kansas City is seeking to prepare the way for an active sales market. This means more airports for light planes. The Chamber of Commerce is urging an airport development program, the first step of which is to provide three additional small airports for light planes. The city now is studying the small airport problem with plans "in the mill" for at least one of these small fields to be built in the immediate future.

No "super-super" plans have been announced — aviation men in Kansas City preferring realistically to take each step in stride. Realizing that airport facilities are an area matter, steps are being taken to bring the several municipalities and counties in Greater Kansas City together to plan airport development.

The most cheerful note in the private flying picture, however, is the planning of the "bread and butter" aviation men themselves. Definite plans for three small airports to be built by private capital and operated by sales and service organizations with modern ideas are on the boards. Meanwhile, the owners of established fields are laying the groundwork for their postwar sales, service, charter and rental business.

Business men, manufacturers and distributors in the "Heart of America" have long known the importance of transportation in the city's development. Even before the war, aviation was such serious business to Kansas Citians that a complete aviation department was set up and staffed in the Chamber of Commerce of Kansas City four years ago. The city administration likewise is alert to its responsibilities and opportunities. Thus, even while bombers, gliders, aircraft engines and accessories for the war are rolling off her production lines, Kansas City is preparing for the new importance of aviation in peacetime business and living.

(NOTE: *This is another in a series of articles describing airport and air traffic cities in the South and Mid-America. Last month's article was devoted to Houston.)*

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Continental Motors Corporation

Aircraft Engine Division

MUSKEGON, MICHIGAN

STRAFING, LOW-LEVEL BOMBING INTENSIFIED

AIR POWER *In Action*

By TOM ASHLEY

WHILE the land invasion of Europe failed to materialize in May, which many had believed the time for it, the air invasion of Germany continued, and Europe, as well as the Southwest Pacific, Burma and China, witnessed a tremendous upsurge in tactical aviation.

Helicopters, Rockets in Debut

Highlighting the intensification of air assaults against enemy surface personnel were several spectacular Allied developments, including the first employment of helicopters in combat aviation, the first U. S. operation of rocket-firing airplanes against enemy troops and the first use of anti-submarine rocket guns by U. S. carrier planes patrolling the Atlantic.

Noticeable, more than previously, was a gradual evening of Allied and enemy air losses in the European and Italian theatres as reflected in the monthly tables published with this series. The following comparisons illustrate the point:

Europe: German losses totalled 504 planes, Allied 373 planes, for the period Jan. 1-25. For Jan. 26-Feb. 25 the comparison was 1,069 German and 714 Allied. For Feb. 26-March 25, the gap narrowed to 728 German, 551 Allied. During March 26-April 25 it closed more, being 844 German, 738 Allied, and from April 26-May 25 the differences simmered down to 821 German and 781 Allied. These figures, as compiled from the daily official communiques, include both U. S. and RAF losses, and it should be pointed out that RAF losses are chiefly responsible for the unevenness, since the under-armed night bombers usually fail to chalk up aerial victories even though they themselves suffer heavy losses. Moreover, rising Allied losses must be expected as the tactical units increase their activity, flying from medium altitudes down to zero and thus exposing themselves to heavy flak, particularly from railroad defenses and airfield concentrations.

Italy: The figures are as follows: Jan. 1-25, 212 enemy, 92 Allied; Jan. 26-Feb. 25, 549 enemy, 169 Allied; Feb. 26-Mar. 25, 232 enemy, 118 Allied; Mar. 26-April 25, 644 enemy, 301 Allied, and April 26-May 25, 297 enemy, 303 Allied (enemy losses do not include planes destroyed by Allied bombers on May 10). Underlying last month's figures, of course, is the very intensive ground push which broke the German lines at Cassino and elsewhere to begin the drive on Rome. Allied aviation operated day and night in great numbers over and in the vicinity of the battlelines, and this is the most costly form of combat aviation. Also affecting the score has been the air campaign against heavily defended German aircraft factories in Southern Europe, attacked more frequently of late by MAAF heavy bombers operating out of Italy.

In both theatres there have been heavy losses of German aircraft on the ground. These cannot be accurately estimated, but probably would serve, if known, to restore the favorable ratio to Allied scores.

The important scores, it must be remembered, are chalked up not so much in the air as on the ground, where air power is destroying the enemy's most vital resources.

Intensification of tactical aviation activities was apparently destined to overshadow operations of Allied strategic forces operating out of England. Day after day the Allied Expeditionary Air Force, containing the largest concentration of tactical-type planes ever attempted in war, dispatched thousands of low-flying craft against the invasion coast, communications linking it to rear depots, airfields in the Low Countries and other tactical targets. Medium bombers, A-20's, P-47's, P-51's, P-38's, P-40N's, Spitfires, Hurricanes, Beauforts, Mosquitos, and other British types were piling up destruction to

(Continued on page 54)

LOSSES IN THE AIR WAR
April 26-May 25, 1944
(Does Not Include Probables or Damaged Totals)

	Europe		Italy		Southwest Pacific		Russia*
	Enemy	Allied	Enemy	Allied	Enemy	Allied	Enemy
Apr. 26	1	38	....	1	1	1	22
Apr. 27	8	51	....	....	3	....	29
Apr. 28	4	5	5	11	....	1	71
Apr. 29	91	77	12	11	....	1	50
Apr. 30	25	6	14	5	....	....	43
May 1	5	16	2	2	3	....	36
May 2	....	....	1	6	....	1	38
May 3	....	49	2	3	8	1	24
May 4	9	3	1	4	....	2	74
May 5	....	•1	34	24	....	2	62
May 6	3	9	8	14	....	1	41
May 7	2	22	29	14	....	1	41
May 8	119	64	....	2	....	1	48
May 9	5	20	....	8	10	....	14
May 10	....	15	13†	35	2	2	45
May 11	25	42	8	2	1	2	32
May 12	150	66	....	18	....	....	20
May 13	63	22	16	9	7	3	35
May 14	15	2	10	6	....	....	33
May 15	6	5	7	8	2	1	19
May 16	7	1	7	6	....	....	29
May 17	7	3	1	15	6	1	25
May 18	3	....	36	21	....	1	43
May 19	133	55	1	10	1	....	31
May 20	2	7	....	6	1	2	52
May 21	20	57	8	5	....	....	17
May 22	30	48	1	5	15	1	14
May 23	....	5	6	9	1	2	9
May 24	79	76	55	31	....	2	17
May 25	9	16	20	12	2	4	18
TOTALS	821	781	297	303	63	33	1032
Totals Since Jan. 1	3906	3157	1934	983	1354	209	5722

OTHER AREAS FOR APRIL 26-MAY 25

CHINA: Thirty-seven enemy planes destroyed at loss of eight. Totals since January 1, 163 enemy, 37 Allied.
PACIFIC: One hundred forty enemy planes destroyed at loss of five. Totals since January 1, 680 enemy, 63 Allied.
SOUTHEAST ASIA: Ninety-three enemy planes destroyed at loss of twenty-eight. Totals since January 1, 331 enemy, 121 Allied.
MIDDLE EAST: One enemy plane destroyed at loss of three. Totals since January 1, 44 enemy, 46 Allied.
*RUSSIA: Does not reveal own losses.
†DOES NOT INCLUDE enemy planes destroyed by bombers, such losses being mentioned but not stated for this particular day.
(NOTE: These figures are compiled by SOUTHERN FLIGHT from daily headquarters communiques issued by the respective commands. They are therefore subject to periodic adjustment. Dates for Southwest Pacific are those on which figures are released; others when action occurred.)

Guinea pigs for grease monkeys

Real production line P-38's and Venturas are guinea pigs for air corps mechanics at Lockheed's factory service schools. These few planes will never see combat like other Lockheeds—but because of *them* others will fly oftener and longer.

Lockheed Trains Specialists

In the Lockheed-operated schools Army and Navy ground crews become specialists—expert in their knowledge of the Army's fighting P-38 or the Navy's tough PV-1 Ventura. Under the supervision of company instructors, they learn the mechanics of maintenance, repair and overhaul, as well as special tricks for keeping Lockheeds in fighting trim.

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Each month 400 new experts leave Lockheed to go to advanced air bases. The lessons they learned in the classroom now are applied to formidable warplanes. Today they are working for victory—but their training has lasting benefit. At war's end they will find their place in the air age to follow. For then, as now, Lockheed will build planes, *get* them ready to fly, and *keep* them flying.

LOOK TO *Lockheed* FOR LEADERSHIP

LOCKHEED AIRCRAFT CORPORATION, BURBANK, CALIFORNIA

The WORLD'S WINGS

By STELLA ZACHAROFF

INDEX TO INDIA

The Song of India in the future will be rendered to the accompaniment of the roar of aero engines and the swish of jet-propelled aircraft. Any country with India's wide open spaces and teeming populace will decidedly bear watching from the standpoint of postwar air transportation. Mother India is pretty nearly in the center of certain huge land masses whence issue the fancier plans for the soon-to-be-with-us Air Age.

India herself has not been as vocal on this issue as her fellow members of the Empire and other countries. But the pressure of history—accelerated by the war—is already running its course.

By the close of last year, a dozen companies had registered in India with the object of engaging in air transport after the war. Spurred by vast expanses and the promising fact that the prewar absence of suitable fields and night flying facilities has been remedied by military works, the commercial interests are setting their sights on a very rapid development.

Indian press, both aeronautical and general, is fostering this consciousness of air destiny by playing up such news as the F. G. Miles "X", the design of the spacious multi-engined airliner of the future "which will soon be needed to keep the British Commonwealth in the forefront of civil air transport."

Hampering progress is the fifteen-year agreement concluded in April, 1939, whereunder the interests of the Indian Transcontinental Airways were ceded to Imperial Airways. Already this has proven expensive in excise duties, in regard to petrol, oil housing, landing, and radio operating charges. This agreement was made by the Government of India without consulting the legislature or the interested commercial factors.

Offsetting unfavorable aspects are promising phenomena like the setting up of a modern aircraft plant now producing, assembling and overhauling aircraft in the state of Mysore. Key positions in the factory are held by Indian and Chinese engineers educated in British and American technical institutions. It is believed that not a single British tool or machine is employed in manufacturing the American Harlow-type training planes and in assembling the latest American aircraft types. The maintenance shops are equipped to service all American planes. A water channel was cut to float and service flying boats. The Hindustan Aircraft, Ltd., is under the direction of William Douglas Pawley, president of the Inter-continent Aviation Corp., of New York.

Domestic air services in India are represented by the Tata Aircraft Co. and Indian National Airways. The Indian service operated by the Chinese National Airways, a Pan-American affiliate, is generally recognized as the most efficient one in the East.

These voices also declare that if Cairo becomes, as suggested, the Near East's great air terminus, then India dominates the map as the avenue of equally great air termini of the "Further" East. In this connection, attention is invited to the ultra-modern travel conception, that of the Great Circle air routes which are expected to come into their own soon. India lies athwart many a significant Great Circle route.

This will not outmode for some time to come the old Empire air route — because it is so outstandingly a trade route — from England to Cairo, Karachi, Calcutta, Rangoon, Singapore, and Australia.

At the same time it should be borne in mind that 2,000 miles is acknowledged as an economic range in consonance with modern air transport ideas. In the light of this, a circle with a radius of 2,000 miles, with Karachi as the center, involves every commercially important area between India and the Mediterranean. A similar 2,000-mile grid centering on Calcutta embraces Burma, Singapore, most of China, and the North Indian frontier trade areas.

Many in India will not settle for less than a position of equality with other Dominions, and already there are rumblings that if this place is denied, India will find a way to equitable recognition.

Speaking generally, one of the more articulate spokesmen for the airminded in those parts, J. R. D. Tata, of Bombay, has put it thus:

"The Air Age is coming whether we like it or not, and we must prepare ourselves with a minimum lag for the new conditions of life which it will bring with it."

That is the keynote.

AIR POWER IN ACTION

(Continued from page 52)

these vital facilities faster than the hard-working Germans could repair them. Hangars, shops, rail yards, motor vehicles and other targets were blasted into shambles.

Japanese Strafed, Too

On the other side of the world, American forces also dropped from altitude to inflict heavy strafing and zero-level bombing damages on the Japs. Thirteenth Army Air Force fighters, type not disclosed, became the first American planes to use rocket guns when they surprised a concentration of forty troop barges in Rabaul harbor, blasting all of them into bits and causing large explosions and fires among shore installations. That was early in May. Later, the Navy revealed its bombers, chiefly those flying off baby flat tops in the Atlantic, were using rocket guns capable of two-mile range. One case was cited where an unusually-large U-boat was sunk by Grumman Avengers which blasted it with rockets, machine guns, and bombs.

The 14th AAF in China proved to be extremely effective in its strafing attacks against Japanese columns bent on a new drive of major proportions against vital Chinese areas. Communiques told in detail how its fighters and medium bombers, and those of the Composite Chinese American Wing, destroyed thousands of Jap troops, tanks, trucks and small boats by strafing.

The Air Commandos of the Southwest Asia Command, whose gliders were the topic of last month's article, gained higher laurels by combining forces with Chinese and American ground raiders to capture an important airfield at Myitkyina, and official announcements at the Command's headquarters told of the employment of Sikorsky helicopters in the Northern Burma invasion. Details of their tactics were withheld, but it was said the windmills and their crews were flown by cargo planes from the U. S. to India, arriving there in January.

★ ★ ★

New P-47

Wright Field has revealed a "new" P-47 Thunderbolt having a new Pratt & Whitney 2,000-plus hp. engine, "several hundred" additional hp. by emergency water injection, speed of more than 400 mph with diving speeds greater than 700 mph., paddle props adding 400 feet per minute to climbing speed, armor plate double the Army's requirements, a new gunsight, eight .50-cal. guns, and a new "bubble" cockpit canopy, electrically operated. Its oxygen capacity has been doubled for longer combat at higher altitudes.

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Machine Shop Foreman at
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Relative Bearing	?	Librascope
Sinking rate		S.B.R.A.
Resonant frequency		Gibson girl
Sensible horizon		Q.D.M. Approach
False cone of silence		Hour angle
Radiosonde		Sweep
Declination		Keneally heaviside layer

DO YOU KNOW . . .

1. Who made the first Atlantic Crossing?
2. Who made the first round-the-world flight?
3. Who made the first glider flight?
4. Who flew the first air express?
5. Who made the first scheduled night flight?
6. What woman made the first flight over the Atlantic?
7. What high ranking officer now in the European theater of war, made the first military Atlantic crossing?
8. What important act by Billy Mitchell changed our military defense plans?

THESE ARE ANSWERED . . . and thousands of words and terms defined. Included are the names of outstanding men and women with a summary of their contribution to aviation. The publishers congratulate the author on this splendid volume, illustrated and handsomely bound in maroon with gold letters (Off the press June 22nd.) Order Now. Only $6.00 Postpaid or C. O. D.

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BOOK REVIEWS

Aerosphere 1943, *edited by Glenn D. Angle, published by Aerosphere, Inc.,* 370 *Lexington Ave., New York* 17, *price* $15.00.

This is the fourth annual edition of this world-wide encyclopedia on aviation. The eight-pound, 1,042-page volume features nearly 700 photographs and drawings and all available data on the military, commercial and private aeroplanes and engines of the entire world.

Extensive specifications, performance, construction and other vital data on the aircraft of the United States, Great Britain, Russia, Japan, Germany and seventeen other nations are given.

Aircraft Analytic Geometry, *by J. J. Apalategui and L. J. Adams, published by McGraw-Hill Book Company,* 330 *West* 42*nd St., New York* 18, *price* $3.00.

Prepared for students in aircraft schools and detailers in the engineering departments of aircraft plants, the book covers Descriptive Geometry, Detail Design, and Fitting Analysis. The material includes 269 practical aircraft problems and 244 illustrations.

Basic Air Navigation, *by Elbert F. Blackburn, published by McGraw-Hill Book Company,* 330 *West* 42*nd St., New York* 18, *price* $4.00.

A practical and proven instructional method is followed in presenting a comprehensive analysis of the air navigator's problems from the time the flight is first planned until the destination is reached. The text is designed to assure adequate basic training with little or no coaching and but average mathematical ability on the part of the reader.

Long-Range Flight, *by Colin Hugh McIntosh, published by McGraw-Hill Book Company,* 330 *West* 42*nd St., New York* 18, *price* $2.50.

The essential techniques of aircraft operation for long distance flight are explained in this book by the chief navigator of American Airlines, Inc. Efficient engine operation, the principles and use of airplane cruising charts, methods of cruising control, and preflight planning are among the subjects covered.

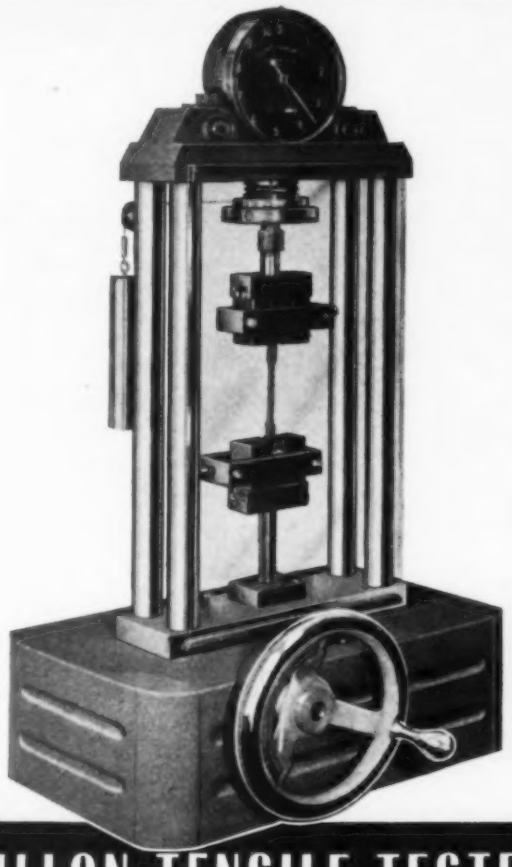
Airplane Engine Mechanics, *by Rolla Hubbard and Augustin Dilworth, published by McGraw-Hill Book Company,* 330 *West* 42*nd St., New York* 18, *price* $3.00.

This manual of questions and answers has been prepared for aircraft employes, mechanics, pilots, machinists, and other aircraft production and operation workers. It should be helpful in conditioning the mechanic for the type and scope of the CAA examination and enabling him to secure his engine license.

NEW LITERATURE

Detroit Tap and Tool Company, *8432 Butler Ave., Detroit, Ill.,* has compiled a handy pocket size, sixteen-page, technical manual (Bulletin HT-43) to enable faster, more accurate sharpening of thread-milling cutters, gear hobs, etc.

Continental Machines, Inc., *1301 Washington Ave., South, Minneapolis, Minn.,* have announced a new DoALL Band Filing machine bulletin containing important information on file broaching operations on metals, wood and plastics.



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Navy Terminates Brewster Contract

Termination of fighter aircraft contracts with the Brewster Aeronautical Corporation was announced last month by the Navy Department, and production of Corsair fighters at Brewster's Long Island, N. Y., and Johnsville, Pa., plants is scheduled to end by July 1. The Navy had earlier announced a cutback in fighter production, explaining battle losses have been less than expected, and it will still be able to maintain its 37,000-plane goal for 1944.

Meanwhile, Shipbuilder Henry J. Kaiser has retired as president of Brewster. Another Brewster development was announcement by Alfred J. Miranda, Jr., Ignacio J. Miranda and F. William Zelcer, large stockholders, that they seek the re-entry of James Work, founder, into the directing management of the firm. The Mirandas and Zelcer indicated they are planning for postwar activities as well as current operations.

Production Cut in Some Combat Types Follows Trainer Output Slash

Cutbacks in production, instituted some time ago for trainers, were affecting some combat airplanes in May, and it might be several months before the industry's monthly output figures mount as high as they did prior to April, when the total of 8,343 planes was less than March's 9,117, and when total airframe weight, 96,000,000 pounds, dropped 6 per cent below that of March.

First terminations in the combat category came when the Navy terminated the Brewster Aeronautical Corporation's contract for Corsair fighters, explaining its battle losses were running less than expected. The Army hasn't given that as an excuse yet, but it and the War Production Board have repeatedly mentioned the need of concentrating more and more on new combat types and heavier bombers. The B-29 program was said to be "on schedule," and heavy bombers of the B-17 and B-24 types are being produced at a rate "substantially" above the 1,000-per-month mark. Willow Run is expected to reach that long-awaited one-per-hour rate of B-24's soon, having already turned out a Liberator every working hour.

What is happening, as pointed out by the West Coast Aircraft War Production Council, is that production is being scheduled fourteen and eighteen months ahead, although current allowances are necessarily made for battle-inspired changes.

Here is the combined record of Boeing, Consolidated Vultee, Douglas, Lockheed, Northrop, North American, and Ryan from 1940 through the first quarter of 1944:

PRODUCTION BY UNITS

Year	Units	Increase Over Previous Period: Units	Per Cent
1940	3,050		
1941	10,918	7,868	257.96
1942	24,826	13,908	127.38
1943	39,725	14,899	60.01
January, 1944	3,907		
February, 1944	4,055	148	3.78
March, 1944	4,353	298	7.34
Total	90,834		
Increase 1943 over 1940		36,675	1,202.45
Increase 1943 over 1941		28,807	263.85
Total Production by units 1941 through 1943			75,469

PRODUCTION BY AIRFRAME WEIGHT
(Less Spares)

Year	Pounds	Increase Over Previous Period: Pounds	Per Cent
1940	12,006,100		
1941	47,006,000	34,999,900	291.52
1942	180,300,000	133,294,000	283.56
1943	384,900,000	204,600,000	113.47
Increase 1943 over 1940		372,893,900	3,105.87
Increase 1943 over 1941		337,894,000	718.83
Jan., 1944	48,097,000		
Feb., 1944	51,068,000	2,971,000	6.18
Mar., 1944	55,776,000	4,708,000	9.22

2,000 Thunderbolts Delivered from Indiana

Over 2,000 P-47 Thunderbolts have rolled from Republic Aviation Corporation's Evansville, Indiana, division since the plant's first unit was test-flown on December 12, 1942, and the division is now well into its third thousand.

16,795 Planes Built by Curtiss Since '38

The Curtiss-Wright Corporation's Airplane division has dug up production figures going back to January 1, 1938, to show it delivered 16,795 planes "since American aircraft production was stepped up in anticipation of the present world conflict." Of the total, 6,080 were built prior to Pearl Harbor. Types produced have been C-46 transports, SB2C dive bombers and P-40 fighters, currently in manufacture, and P-47 fighters, C-76 transports, A-25 dive bombers, O-52 observation craft, SNC-1 trainers, AT-9 trainers, SOC scouts, SOC observation craft and P-36 fighters, formerly produced. Ten thousand P-40's were built, and the model now in production is the P-40N.

B-25 Output Centered in Kansas; California Concentrates on P-51

The Kansas City, Kansas, plant of North American Aviation, Inc., will assume the entire production program of B-25 Mitchell bombers as of July 8, enabling the Inglewood, Calif., plant to devote its entire attention to production of the P-51 Mustang. J. H. Kindelberger, president, said the transfer does not indicate a slackening of B-25 production, as the Kansas plant is scheduled to produce more B-25's this year than both the Kansas and California plants turned out last year. No increase in employment at Kansas City will be necessary; plans for the change have been under way for "many months," it was explained.

Enlarged Facilities for New Orleans Plant

An $800,000 contract has been made by Consolidated Vultee Aircraft Corporation with the Defense Plant Corporation for additional plant facilities at the New Orleans division of Convair. The new contract brings an over-all commitment of approximately $12,000,000.

Jet Research Advanced by Opening of NACA High Altitude Tunnel

The National Advisory Committee for Aeronautics has begun operation of its new altitude wind tunnel for aircraft engine research at Cleveland, Ohio. First of its kind in the world, and devoted to secret investigations of what NACA briefly referred to as "new military power plants, including jet propulsion systems," the new tunnel is the most complete yet developed for eliminating high altitude power plant "bugs" before the airplane involved goes into production.

Engines of 3,000 horsepower and even greater output can be tested in the tunnel's twenty-ft. test section. It was designed to simulate sub-zero temperatures encountered at 30,000 feet, but can boost pressures to equal 50,000-ft. operating conditions. Low air pressures are maintained by four large reciprocating exhausters. Fourteen Carrier refrigerating units, by means of a copper-plate fin type of heat exchanger, provide the main refrigeration. Their capacity, if utilized for ice-making, would manufacture 10,000 tons of ice each twenty-four hours. Twenty thousand gallons of cooling water per minute transfer heat to the surrounding air via the cooling tower. An 18,000-hp. electric motor drives the thirty-one-foot, twelve-bladed tunnel fan.

Growth of Australian Aircraft Industry Cited

Development of Australia's wartime aircraft industry was traced recently by that government, showing the country's advance from 1939, when a small number of American-designed Wirraway trainers, were built in a government plant at Melbourne, and wings and tail sections for a small British-type trainer were built at a DeHavilland plant in Sydney, until recently, when more than 600 contractors were making 40,000 different types of parts and equipment, including great amounts for the U. S. Army Air Forces. The original DeHavilland plant was enlarged until it was producing two planes daily in 1941, and the Wirraway plant also initiated production of an Australian designed trainer, the Wackett. Combat planes went into production after the British announced, on the fall of France, that England could no longer supply Australia, and 500 Beaufort fighters were built by late 1943. Today Beauforts are produced in six plants. Following Pearl Harbor, Australia began production of a locally-designed bomber and an interceptor. Major companies have subsidiary plants there building engines such as Pratt & Whitneys and Gypsy Majors. The U. S. 5th Army Air Force has purchased about $50,000,000 worth of spare parts and belly tanks from Australian factories.

More Expansion for Fort Worth Factory

A $2,000,000 facilities expansion program for Consolidated Vultee's Fort Worth division was recently approved by the U. S. Corps of Engineers. The expansion program calls for two 100,000 sq. ft. warehouses, enlargement of the existing salvage warehouse, an addition to the cafeteria more than doubling its present seating capacity, approximately 500,000 square feet of road and yard paving, necessary railroad connections, a new employes' parking lot, a new road to the plant grounds and miscellaneous improvements. One of the new warehouses will house raw stores, the garage and a new fire station. The other new warehouse will house maintenance stores and paint mixing facilities. The addition to the cafeteria will raise seating capacity from 500 to over 1,300. The new facilities will allow for an engineering test laboratory and space for the plant's blueprint section in a part of the engineering building used for storage, and the present garage space in the engineering building will be converted into office space. A recent contract between the Fort Worth division and the AAF Materiel Command at Wright Field provides for $525,000 worth of machinery and equipment for experimental purposes, and for the enlargement of the 150-foot gate from the hangar apron to 250 feet.

Nash-Kelvinator Adds Bigger Engines, 4-Bladed Propellers to Its Output

Nash-Kelvinator will soon begin large-scale production of new four-bladed Hamilton standard propellers and Pratt & Whitney R-2800-C 2100 hp two-stage, supercharged aircraft engines which will increase the speed and carrying capacity of Navy Corsair and Hellcat fighters, George W. Mason, president, disclosed. The new contracts will not interrupt the company's current assembly line production of three-bladed Hamilton Standard hydromatic propellers and two-stage supercharged Pratt & Whitney 2000 hp engines. Other United Aircraft products built by Nash-Kelvinator are propeller governors and Sikorsky helicopters. In addition, the company and its associated companies manufacture bomb fuses, binoculars, incendiaries and aircraft instruments.

Renegotiators Charged With Ignoring Costs

Airplane manufacturing companies will face the danger of financial bankruptcy after the war because government renegotiators and cost analysts refuse to allow all costs actually incurred as such, according to Clinton Davidson, president of Management Planning, Inc., of Jersey City, N. J. Alleged profit of aircraft companies was reduced by renegotiators in 1943 to where most of the larger companies made less than 3 per cent (after taxes) of the contract price on 1942 business, he said. Davidson stated that aircraft companies have many expenses not allowable by Army auditors, many of the expenses direct charges such as surplus materials purchased, freight-in charges and indirect charges such as group health insurance for employes, advertising, legal expenses and similar items. Aircraft companies also suffer losses on commitments to vendors and subcontractors and in inventory which are not reimbursed. A future possible loss is "post-termination momentum expense," Davidson said, pointing out that when a contract is cancelled the monthly expenditures of a big aircraft company can not be stopped the instant the cancellation notice is received. Under present laws, he said, the slightest delay or error in cutting off these expenditures after termination are chargeable to the company.

AT-21 Cutdown Slows McDonnell; New Combat Type May Be Built

Production of the AT-21, advanced trainer built by McDonnell Aircraft Corporation, will be terminated at the completion of the sixty-ninth airplane not later than December 31st, the Army Air Forces notified the company recently. Curtailment of AT-21 production contracts held by Fairchild Engine and Airplane Corporation and Bellanca Aircraft Corporation have also been effected by the AAF under its present policy to reduce the training program and emphasize production of combat aircraft. M.A.C. had reached its peak of employment in Memphis under the AT-21 contract, and following termination of the contract, personnel was reduced from 1,140 to 1,000. This number will largely be maintained, the company said, until August when employes required on the AT-21 contract will be reduced gradually to 200 by January. Negotiations are being carried on with the AAF concerning a production contract for a combat type airplane designed and developed by M.A.C. under contract to the AAF, which is now being test flown. If this combat plane should go into production, the company said, operations in Memphis would probably be expanded rather than curtailed.

Electrical Council Formed to Aid Aircrafters

An Aircraft Electrical Council has been organized by member companies of the National Electrical Manuafacturers Association with an aim to make available to the aircraft industry the facilities of the electrical manufacturing industry. N. J. MacDonald, vice president of Thomas & Betts Co., was elected chairman by representatives of the forty-five companies now holding membership in the Council. H. W. Clough, Belden Manufacturing Company, and W. H. Eldridge, The Holtzer-Cabot Electric Co., were elected vice chairmen. Members of the co-ordinating committee are MacDonald, chairman; Clough, Eldridge, L. H. McClure, Colt's Patent Fire Arms Mfg. Co.; W. A. Mechesney, Westinghouse Electric & Mfg. Co.; P. C. Smith, The Arrow-Hart & Hegeman Electric Co.; R. R. Titus, Synthane Corp.; K. H. Runkle and L. F. Adams, General Electric Co.; and E. S. McConnell, U. S. Rubber Co. Members of the membership committee are McConnell, chairman, Mechesney, Titus and Runkle. The council will keep abreast with aircraft activities, supplying its member companies with information on trends and changes affecting production, and will develop purchase specifications and prospective uses in other fields for electrical products originally designed for the aircraft industry, the NEMA stated.

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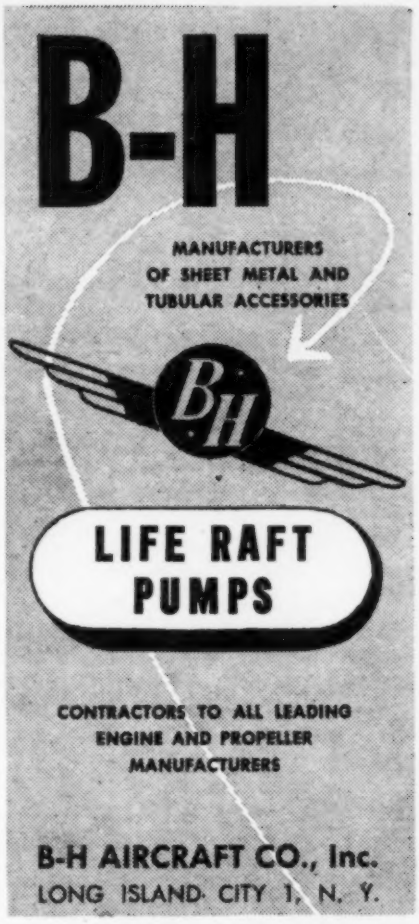

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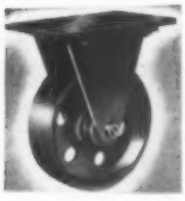

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Screw Machines Survey

A new service for locating available screw machine capacity has been set up by the National Screw Machine Products Association. Member companies are reporting machine capacity available and that expected to be available shortly, and the Association will furnish names of these suppliers free to buyers of screw machine products. Inquiries, with description of the required part, including type of material, tolerances and quantity required, should be addressed to Dept. K., National Screw Machine Products Association, 13210 Shaker Square, Cleveland 20, Ohio.

Adel's Record Cited

A record of 200-million line support clips produced since 1938 with seven price reductions effected through mass production and greater worker efficiency was recently celebrated by Adel Precision Products Corporation. The clips now sell for 54% less than their original price, resulting in a savings to aircraft manufacturers of $1,452,000. About 1,750,000 pounds of duraluminum, an estimated 2,511,000 man-hours and a total payroll investment of approximately $2,600,000 went into the making of the 200-million clips. Adel produces 9,000 types and sizes of the patented line support clip. In addition, 3,000 types and sizes of line support blocks are made for multiple line installations. The clips are used to fasten down aircraft plumbing, the myriad fuel, oil, hydraulic tubes and electric conduits. A single B-17 uses over 10,000 clips. The Adel supports are also used to fasten down plumbing in tanks, and wires and tubes in trucks, jeeps and various marine units.

Industrial Training Big Item

Consolidated Vultee Aircraft Company's San Diego division gave 8,000,000 man-hours of training of all types to 78,704 employes during 1943 and 1944, the education section of the company's industrial relations department reported recently. Some 27,000 Convair employes, many of whom were without previous experience or skill in the aircraft industry, were given vocational training for production jobs. Over 8,000 received supervisory training and 14,000 men and women completed college grade training courses during the two years. "Customer training", to instruct Army crews in operation and maintenance of the Liberator bomber, conducted at Lindbergh Field's Camp Consair, proved so valuable that RAF, RCAF and RAAF men were sent there. A similar school has been placed in operation for the Navy at Hutchinson, Kansas. Over 15,000 men were graduated for service in the armed forces. Auxiliary defense training for protection of personnel and property in the face of enemy attack or sabotage was given to over 12,000 more employes. While the four-year apprentice program for aircraft mechanics and aircraft engine technicians, now in its third year, has not been measured statistically, the education section stated it was expected to prove very valuable. Lewis C. Tompkins, education general supervisor, is in charge of the industrial training program at Convair.

Cleveland Pneumatic Tool Marks Fiftieth Birthday

The fiftieth anniversary of the Cleveland Pneumatic Tool Company will be celebrated by the company during June, 1944. The company developed the Gruss air spring used on commercial trucks and buses, and later applied the air-oil shock-absorbing principle to landing gear. The company manufactured the first air-oil shock strut, now called an aerol, and also developed a device for the fastening of "skins" preparatory to riveting, which is now known as "clecoing." Almost all of the company's peacetime products, the pneumatic tools, aircraft landing gear, shock absorbers for military rolling stock, rock drills and other mining and construction machinery are being manufactured for the war effort.

Bristol in Houston

A Houston branch office has been opened by The Bristol Company, Waterbury, Connecticut, manufacturers of automatic control and recording instruments, H. E. Beane, sales manager of the company, announced recently. The new office, which will serve Louisiana and Texas, with the exception of the Panhandle, is under the direction of D. D. Ault, Bristol sales engineer in Houston for many years. Ault, who joined the Bristol Company in 1926 as sales engineer, has been associated with the Pittsburgh, Philadelphia and New York branch offices and spent two years on special assignments at the Waterbury factory. The new Houston office is located in the Citizens State Bank Building.

Firm Changes Name

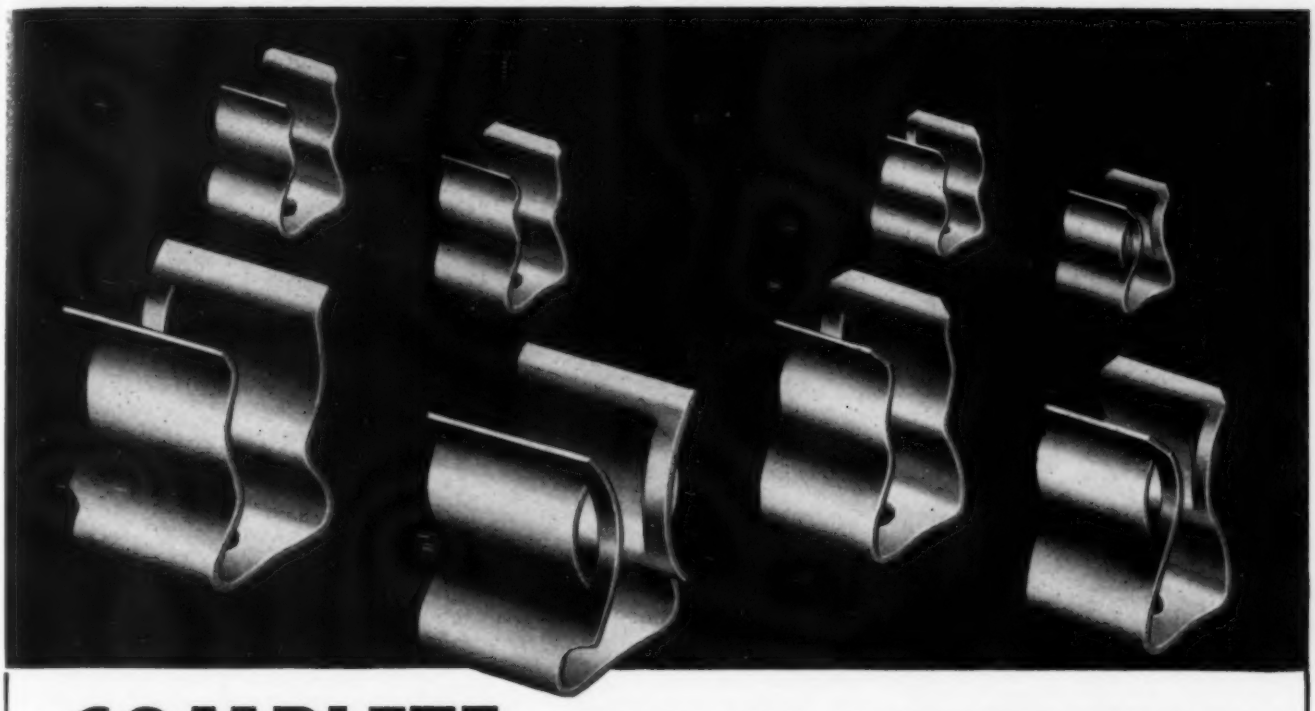
The company name of Atlantic Rayon Corporation, successors to Suncook Mills, manufacturers of Flightex fabric and tapes for the aircraft industry, has been changed to Textron, Incorporated, due to the acquisition of the Flightex fabrics, which has made the company a manufacturer of cotton and nylon as well as rayon fabrics. The industrial fabrics division, which produces Flightex fabrics and tapes of cotton, and also nylon for parachutes, will be called Flightex fabrics division, Val Dietz, Jr., general manager of the division, stated. Post-war plans of the Flightex division include production of special coated interior fabrics for the aircraft and automotive industry, upholstery fabrics, slip cover materials, etc.

Single-Disc Brake Improved for Heavy Planes

The Goodyear single-disc airplane brake has been improved in design for use on heavier planes according to C. O. Bell, manager of the airplane division of The Goodyear Tire & Rubber Company, Inc. Goodyear multiple-disc brakes are now used on airplanes of all weights and classes, but the single-disc type developed by Goodyear shortly before Pearl Harbor has been restricted to special purpose light planes, Bell stated. The Goodyear single-disc brake saves an average in weight of as much as 20 per cent over multiple-disc construction and the simplicity of design reduces maintenance and replacement costs. There are fewer parts and they are engineered for mass production. Increased capacity is also claimed by Goodyear for the single-disc brake because of its rapid heat dissipation.

New Convair Inspector

J. Y. McClure, general supervisor of B-24 and C-87 major and final assembly at the San Diego division of Consolidated Vultee Aircraft Corporation, has been transferred to Fort Worth as chief of inspection. He was formerly associated with Lockheed and Northrop.



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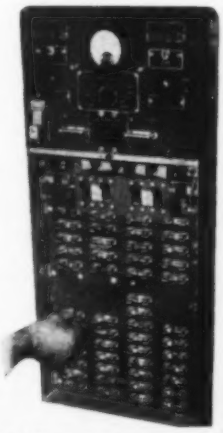

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AIRLINES

Fourteen More Planes for Carriers; Fleets Listed

The return of fourteen additional DC-3 aircraft to the airlines was announced recently by the Post Office Department and the Civil Aeronautics Board. Simultaneously, the CAB listed the number of transports of all types operated by the various carriers as of May 18, 1944, as follows: American 52, United 42, TWA 34, Eastern 24, PCA 10, Braniff 8, Northwest 10, Delta 6, Western 5, C & S 5, Colonial 2, Northeast 2, Continental 4, National 4, Mid-Continent 4, and Inland 2. These total 214, as compared with a total of 314 operated as of May 18, 1942.

Domestic and American flag airlines actually relinquished four times half of their equipment to the war effort from September, 1939, to April 15, 1944, in contrast to a general public understanding that the airlines gave up half their equipment, an analysis made public by Colonel Edgar S. Gorrell, president of the Air Transport Association of America, revealed. The airlines contributed a total of 650 planes in three ways: by outright sale of aircraft in use to our Allies, 45; by releasing aircraft in use to the armed services of the United States, 295, and by relinquishing to the armed forces aircraft on order with manufacturers, 310.

Air Traffic Conference in Denver July 17-18

The Annual Air Traffic Conference of America will convene in Denver, for the second consecutive year, to discuss wartime problems on July 17-18, Paul J. Carmichael, general traffic and cargo manager of Continental Air Lines, announced recently. Braniff, Inland, United and Continental will act as joint hosts to the conference, and following business sessions the airline men will visit the Phantom Valley Ranch near Grand Lake, Colorado. The conference, a division of the Air Transport Association, is expected to be attended by vice presidents of traffic and advertising experts from Pan American, American Export Airlines, Alaskan and Canadian airlines as well as representatives of domestic airlines, Carmichael stated. Officers of the conference are Charles E. Beard, vice president of traffic, Braniff Airways, president; Nels Fry, general traffic manager, United Air Lines, first vice president, and M. F. Redfern, Air Transport Association, Washington, secretary.

Feeder Airlines Organize in June

Companies now operating or expecting to operate feeder airlines will meet June 15-16 in Washington, D. C., to organize the "Feeder Airlines Association." Harry R. Stringer, chairman of the organizing committee, said the meeting will activate policies and purposes of the group, consider proposed changes in its Articles of Association, and elect permanent officers. Its twenty-five charter member firms are All American Aviation, Inc., Automatic Air Mail, Inc., Aviation Enterprises, Ltd., Central States Aviation Corp., Clear Ridge Aviation, Inc., Coast Aviation Corp., Consolidated Airlines, Inc., Dixie Air Transport Co., Inc., Hawthorne Airways, Hylan Flying Service, Inc., Kansas Aviation Company, Land Water Air Service, Mercury Development Corp., Mountain States Aviation, Inc., Otto Aviation Corp., Parks Air College, Inc., Racine Flying Service, Inc., Ryan School of Aeronautics, Southair, Inc., Southeastern Air Express, Inc., Southern Aviation Corp., Southwest Airways Co., State Airlines, Inc., Virginia Central Airlines, and West Coast Airlines. These firms now operate or have applications pending to operate a total of 140,561 route miles of feeder services.

Cargo Gains Listed

Rail-air express shipments for commercial airlines in the first three months of this year increased 19.6 per cent over the first quarter of 1943, the air express division of Railway Express Agency reported recently. A total of 110,342 shipments were moved in the combined service during the three months, compared with 92,223 shipments during the same period last year. Express charges were up 17.5 per cent for the first quarter of 1944. The co-ordinated air and rail express schedules connect 350 U. S. and Canadian airport cities served by airlines and 23,000 off-airline points served by Railway Express.

Airline Safety Awards

Last year's domestic airline safety record—1,225,000,000 passenger miles without a fatality — was recognized recently by the National Safety Council in awards to Eastern Air Lines (Group A; over 100,000,000 passenger miles), Braniff Airways (Group B; 10 to 100 million passenger miles), and National Airlines (Group C; less than 10 million passenger miles). The record is the equivalent of picking up at their home airports every man, woman and child in the cities of Birmingham, Little Rock, Beverly Hills, Denver, Hartford, Tampa, Des Moines, Louisville, Baltimore, Dayton and the two Portlands, plus all the people in Nevada, Wyoming and Vermont, and flying them to points 200 miles away and bringing them safely home again.

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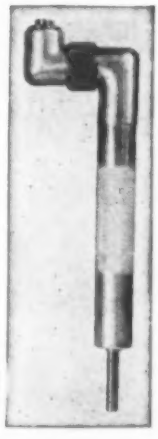

N. Atlantic Service Reopened

Pan American Airways has reopened for the fifth year its scheduled summer Clipper service across the North Atlantic from New York to the British Isles, with two stops at Canadian and Newfoundland ports. Regularly scheduled mail, passenger and express service on the 3,089-mile northern route will continue through the summer, with the Clippers arriving in Britain twenty-four hours after leaving La Guardia Field, N. Y.

Ryan Seeks Carrier Routes

Ryan School of Aeronautics, San Diego, has applied to the Civil Aeronautics Board for two international air transport schelules, one from the West Coast to Calcutta, India, via Honolulu, Midway, Tokyo, China, Burma, and Indo-China, and the other from the Pacific Coast to Havana, Cuba, via Tucson, El Paso, San Antonio, Houston and New Orleans. The Asia schedule would also branch at Tokyo to service portions of Russia, Manchuria and China, with both routes scheduled for a weekly round-trip. The route to Cuba, could begin as soon as airline equipment is available, on daily schedules, with the trans-Pacific run planned for after the war. Recently Ryan proposed a net work of local feeder airline routes to over 100 cities in California.

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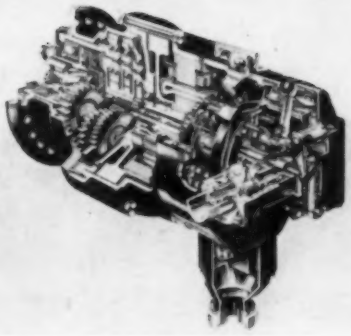
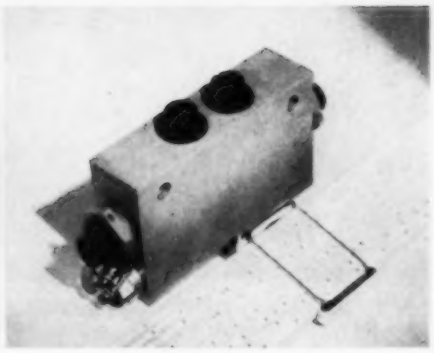




Portable Test Machine

A portable tensile testing machine has been announced by the W. C. Dillon Company, Chicago. The new machine is said to do precision testing of spot welded specimens, riveted assemblies, plastics, cloth, wire and rubber with the same precision of a larger model. Pressure up to 10,000 pounds can be applied. The gripping jaws which secure the object to be tested can be removed, allowing a compression cage to be inserted to test specimens like wood, springs, plastics, etc. Also interchangeable is a transverse testing fixture to test bakelite, glass materials, according to the company.

Thread Gages In New Line

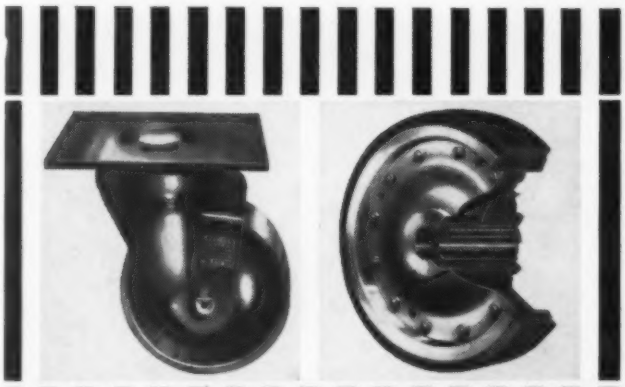
A new line of gages are now offered by Pratt & Whitney, West Hartford, Conn. The gages are said to give a rapid and accurate check on pipe threads made to the latest Army and Navy Specifications known as Spec. An-GGG-P-363 Amendment No. 2, Symbol ANPT. The new gages are made in a complete line. For checking the accuracy of internal threads there is a double end gage, and there is a plain paper gage which has six steps for classification of the thread. For checking external threads there is a set of two special ANPT tri-roll gages.

High-Speed Starter

A new aviation engine starter for high speed cranking of engines in the 1,200 to 2,500 hp class with reserve for larger engines that may become available up to 3,000 hp, has been announced by Eclipse-Pioneer Division, Bendix Aviation Corporation. Called Series 48, the new starters provide four methods of cranking, including: combination inertia and direct, for normal operation; direct, for warm engine starting; inertia when the batteries are low; and hand cranking. They are said to provide an initial cranking speed of 115 rpm followed by a direct cranking of 60 rpm.

New Valves for Protection

Three new hydraulic lock valves designed to protect machine gun turrets landing gear and other controls against operational failures due to leakage are now being produced by the Adel Precision Products Corporation, Burbank, according to the company. The new valves lock hydraulic fluid in cylinders or hydraulic motors until the directional control valve is operated, thus maintaining pressure in the actuating mechanism. Hydraulically locking the cylinder they are opened by pressure released by the selector valve. Critical operating parts are made of corrosion-resistant steel.



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PERSONALS

COMMANDER ROLAND G. MAYER has been appointed manager of Consolidated Vultee's Fort Worth Division. C. W. Perrelle, Jr., Convair vice president in charge of manufacturing, has been acting as manager. . . . At the age of thirty-six, WILLIAM P. GWINN, who joined the organization seventeen years ago, has become general manager of the Pratt & Whitney engine division of United Aircraft Corporation. . . . CLEEMAN WITHERS, former officer of the Sperry Corporation and United Aircraft Products, Inc., has been appointed to the general manager's executive staff of the Ranger Aircraft Engine division of Fairchild. . . . GARET W. DENISE, formerly with Republic Aviation Corporation, and veteran production authority, has become general manager of Chicago plant operations of Littelfuse, Inc. . . . ARMAND J. GARIEPY has been appointed contracts and service manager of Lawrance Aeronautical Corporation. He formerly held posts with American Airlines, U. S. Aviation Underwriters, and the Rubber Development Corporation. . . . E. B. SPORLEDER, executive engineer of Douglas Aircraft Company, Santa Monica, has been named national chairman of the Airworthiness Requirements Committee of the Aeronautical Chamber of Commerce of America.

L. M. BACH has been promoted to general works manager in charge of manufacturing operations at all Lockheed A and B plants. Other Lockheed appointments include: D. J. HAUGHTON, assistant general works manager; G. H. PRUDDEN and F. PENN HOLTER, works managers of A and B plants, respectively; E. STACKHOUSE, director of manufacturing development; ROGER LEWIS, director of purchases; E. A. Brown, director of material control, and WALTER G. HOSKINSON, director of inspection.

T. C. SULLIVAN, formerly with the Wall Street Journal and Vultee Aircraft, Inc., has been named assistant to the president of United Aircraft Corporation. . . . JOSEPH M. BARR has relinquished his post as assistant general manager of Chance Vought division to become manager of the export department of United Aircraft Corporation.

GUS LEAZAR, former assistant chief of the CAB Safety Bureau's Investigation Division, has been elected a director and vice president of Southeastern Air Service, Inc., and will devote his full time to development of post-war fixed base and feeder airline operations. Cody Laird, president, also announced election of JAMES V. CARMICHAEL, attorney of Marietta, Ga., as a director.

Metals Chapter Formed

A Dallas chapter of the American Society for Metals was recently organized and temporary officers appointed to serve until regular officers are elected. R. V. Wheeler, chief engineer, Aeronautical Engineering Consultants, has been named chairman; R. A. Stewart, Continental Motors, vice chairman; J. K. Grace, North American Aviation, secretary, and C. E. Perkins, North American Aviation, treasurer. The nominating committee members appointed for the new chapter are C. E. Perkins, chairman; H. N. Cedergren, consulting metallurgist; F. H. Miller, Acme Supply, and H. H. McKinney, Continental Motors.

New SAIE Group

Plans for a Dallas-Fort Worth group to affiliate with the Society of Aircraft Industrial Engineers were completed recently at a meeting of seventy-eight representatives of Consolidated Vultee Aircraft Corporation, Globe Aircraft and North American Aviation. C. C. Shafer, Consolidated Vultee, a former national president of SAIE, was named chairman of a committee to prepare and submit a membership petition to the national organization. Other members of the committee are G. L. Stanley, Globe Aircraft; F. W. Hale, North American, and Verser Gillon, Consolidated Vultee. Joe D. Horn, Consolidated Vultee, was named chairman of the membership committee.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS' latest picture was made on April 20 and shows the men responsible for many U. S. advances in aviation. Left to right, they are: Seated nearest camera—William Littlewood, engineering vice president, American Airlines, and Dr. Theodore P. Wright, director, Aircraft Resources Control Office, WPB. Around the table—Dr. William F. Durand, Stanford University; Maj. Gen. O. P. Echols, AAF Materiel, Maintenance and Distribution; Dr. Vannevar Bush, director, Office of Scientific Research and Development; Vice Admiral John S. McCain, Deputy Chief of Naval Operations (Air); Maj. Gen. Barney M. Giles, Chief of Air Staff, representing Gen. H. H. Arnold; Dr. Orville Wright; Dr. George W. Lewis, Director Aeronautical Research, NACA; Dr. Jerome C. Hunsaker, Chairman, NACA; John F. Victory Secretary, NACA; Dr. Charles G. Abbot, Secretary, Smithsonian Institution; Dr. Edward Warner, Vice Chairman, Civil Aeronautics Board; Dr. Lyman J. Briggs, Director, National Bureau of Standards; Rear Admiral Ernest M. Pace, Special Assistant (Material), Navy Bureau of Aeronautics; William A. M. Burden, Assistant Secretary of Commerce, and Dr. Francis W. Reichelderfer, Chief, U. S. Weather Bureau.

Four Design Categories Proposed by CAA to Further Utility, Lower Costs of Personal Planes

The CAA made history last month by proposing a new system of design requirements to improve personal airplane utility. "Increased knowledge of airplane design, plus an expanding market, makes a category system of airplane design requirements practical at this time," commented CAA Safety Regulation Director Fred M. Lanter. "Under this plan, manufacturers need incorporate only those design features essential for the intended use, and thus can increase the overall efficiency of the design for that particular use. The family airplane will not be required to meet the same stresses as a plane which will be subjected to acrobatics, and the weight thus saved can be put into additional fuel, baggage, passenger capacity, instruments or other features."

Going into details, Lanter said the CAA has suggested for industry study the design categories of "acrobatic," "training," "general purpose" and "special purpose." At present, special requirements for transport planes are in effect, but all other classes of civil aircraft must be built to the same strength requirements. The new plan calls for top strength for acrobatic planes, with emphasis on power plant efficiency for at least short periods of inverted flight, and visibility for acrobatic flying. Training planes would be in a second strength class, to cover such primary training maneuvers as spins, chandelles, wing-overs, etc., but not snap rolls and other such abrupt acrobatics. In the "general purpose" category, requirements would emphasize good controllability at the stall, with strength features the same as in the transport category, since both types of operation avoid maneuvers imposing sharp stresses. Airplanes in the "special purpose" category would be considered as separate cases.

It would still be possible to have a plane certificated in more than one category. For example, a plane in the training category could be used in "general purpose" operations carrying a higher weight, or in the acrobatic category at a reduced weight.

The CAA, already in discussion with the industry, wants to hear an expression of opinions on the proposal. "We desire," explained Lanter, "to carry out this task in a way that will promote the use of the airplane to the greatest degree consistent with public safety. We believe our proposal of design categories is a step in this direction. But we are anxious to have the comments of all interested before asking the Civil Aeronautics Board to revise the regulations."

Training Contractors Ask Strong Air Policy, Elect New Directors

Recommendations for a strong government air policy, with "further clarification of regulation and airport policy," were voiced by the Aeronautical Training Society at a meeting of Army contract flying school operators in New Orleans last month.

J. Wendell Coombs, president, said the following directors were elected for the coming year: Wesley N. Raymond, Douglas, Ga.; Beverly E. Howard, Orangeburg, S. C.; Albert I. Lodwick, Lakeland, Fla.; William F. Long, Dallas, Texas; Bennett Woolley, Corsicana, Texas; William R. Kent, Memphis, Tenn.; C. C. Moseley, Glendale, Calif.; Leland Hayward, Beverly Hills, Calif.; and Harry S. White, Palo Alto, Calif.

Top officers of the Army Air Forces Training Command, Chairman Thomas H. Beck of the Civil Air Patrol League; Lt. Col. Earle L. Johnson, Civil Air Patrol commander, and others were guests. Oliver Parks of St. Louis, urging government-furnished land, draining and lighting to start off an intense airport-building program, forecast that air travel expansion will support the improvements in much the way highways have been developed. The Society voted to inaugurate a postwar planning program.

Texas Private Fliers Reorganize for Fight

Dormant for nearly three years as a result of a decision in 1941 to disband for the duration, the Texas Private Fliers Association voted at Dallas, May 20 to reorganize. The meeting called by the old officers in answer to a statewide demand for reactivating the group and to protest threatened gasoline rationing by the OPA, was attended by more than 250 Texas airmen and held at the Lou Foote Airport.

President Roy R. Taylor of Ft. Worth was empowered to appoint a nominating committee for new officers, a membership committee and a convention committee for choosing the time and place for the 1944 annual convention. It was unanimously agreed to reorganize the Association and empower a committee to present recommendations for modifying or changing the present constitution and by-laws.

Vigorous protests were voiced during the meeting over threatened OPA action that would further restrict low octane airplane fuel in the 73-80 octane bracket. The group voted unanimously to send the following telegram to all Texas members of Congress:

"The Texas Private Fliers Association in general session at Dallas representing Texas aviation interests formally protest additional restriction of and reduction in rationing of 73 and 80 octane aviation fuel for non-scheduled civil aviation. We understand there is no shortage of these octane fuels. Therefore further restriction will not advantageously serve the war effort but will annihilate thousands of civilian pilots, airports, training operations and essential transportation facilities all over the nation. We urgently protest proposed moves by Office of Price Administration which will strike the death blow to the one aviation facility that provided the men and the airplanes for expansion of our military air services which yet may be called upon again in some future crisis now unforeseen. We urgently and respectfully seek your investigation of and advice in this matter to the end that you will do everything in your power to protect this vital phase of our national life."

In addition to President Taylor, TPFA officers include Leslie R. Stringer, Wichita Falls, and Ellis Gotcher, Houston, vice presidents; Gene Royer, Ft. Worth, treasurer; and George Haddaway, Dallas, secretary.

P-51's in Speed Dash

A new transcontinental speed record and a new transcontinental non-stop speed record were set last month by two P-51 Mustangs in cross-country hops from Inglewood, California, to New York in six hours and thirty-one and one-half minutes and six hours and thirty-nine and one-half minutes respectively. Colonel Clair Peterson, personal pilot to General H. H. Arnold, set the new speed record in the cross-country hop of 2,470 miles, making one stop for refueling at Kansas City, where the plane was checked and refueled in the record time of four minutes and fifty-five seconds. The non-stop speed record was set by Lieut. Col. Jack Carter, P-51 project engineer for the Wright Field Materiel Command, who flew the great circle route used by service planes from West to East of 2,464 miles. Col. Peterson averaged 402 mph. on the flight to Kansas City, and 378.54 mph. average for the entire trip. Each plane was fitted with extra long-range gas tanks similar to those used during fighter escort duty in combat, and the pilots used oxygen all the way.

Large Attendance for Airport Conference Expected

The First Annual Airport Management Short Course and Conference sponsored by the Civil Aeronautics Administration and the School of Engineering of Texas A. & M. College of Texas will be held on the college campus at College Station, Texas, June 14, 15 and 16. Planned by the 4th CAA region officials and A. & M. College, the conference is not limited to that area and the response indicates a nation-wide participation. The tentative agenda includes discussion of airport management, operation, planning (location, financing, design and construction), and maintenance. The college provides room and board on the campus for approximately $3.50 per day to those who will attend. Howard Barlow, head of the A. & M. Aeronautical Engineering Department, is general chairman.

No "Cheap" Planes Soon, Says Taylorcraft Exec.

If peacetime planes are available at lower prices, it will be because of mass production experience gained by manufacturers in turning out Army and Navy planes, according to Richard G. King, assistant to the president of Taylorcraft Aviation Corporation, Alliance, Ohio. However, any great decrease in airplane prices immediately after the war's end cannot be expected. Just as the public will have to pay from fifteen to twenty per cent more for automobiles than before Pearl Harbor, the airplane cost will not be lowered for some time, King stated. Many wartime innovations, such as elimination of bottlenecks, substitution of materials and efficiency methods in manufacturing have brought savings in cost and time, "but due to other wartime conditions, higher prices all along the line, the full effect of these savings will not be felt for some time." Raw materials of various kinds now made scarce by war demands must be plentiful and at lower costs and the high cost of doing business reduced, before airplanes will be available at bargain prices, King said.

Only Eleven Deaths in Flight Among 173,527 Casualties Moved by Air

Air evacuation of American sick, wounded and injured personnel, with only eleven deaths in flight among the 173,527 transported by plane in 1943, has been cited by the U. S. Army Air Forces Medical Services as a considerable contribution to the tactical success of every major American offensive. Air evacuation by means of troop and cargo carrier planes equipped to take on patients after delivering loads to forward areas solved the logistical problem of casualty evacuation without any addition of vehicular equipment to the Medical Corps and reduced the need for hospitalization facilities in forward areas, according to Maj. General David N. W. Grant, Air Surgeon General. Eleven Air Forces overseas moved 161,541 patients of the 173,527 evacuated by air in 1943. The Twelfth Air Force alone, in a Mediterranean theatre, carried 58,479 patients for a total distance of 16,491,266 miles with only one death in flight, though half of the evacuees were litter patients. Many cases of those evacuated by air were so serious that a delay in transportation to a base hospital would have added greatly to the death toll. In Tunisia air evacuation from one combat area to the nearest general hospital required one hour as compared to twelve or fifteen hours by motor ambulances and twenty to twenty-two by hospital train. The AAF first evacuated patients by air on a large scale during the summer of 1942 New Guinea counter-offensive when the only means of moving patients from the Buna-Gona over the 9,000-foot Owens Stanley Mountains to Port Moresby was the plane.

Okahomans Form Company

Central Airlines, Inc., has been organized as a $100,000 corporation at Oklahoma City for non-scheduled intra-state operations, with the following officials: Guy O. Marchant, president; Keith Kahle, founder, vice president and general manager; L. L. McMillon, operations manager and chief pilot, and Edwin Keith Cornish, traffic manager.

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CAA Unit Aids City Airport Planners

An Urban Planning Section to assist metropolitan areas in the development of airport plans has been established by the Civil Aeronautics Administration. Eric von Hausswolff and Edgar N. Smith have been appointed planning consultants, and are at work in the Philadelphia area, co-operating with the Philadelphia City Planning Commission, representatives of eight adjoining counties of Pennsylvania and New Jersey, and the Aeronautic Commissions of the two states. The method employed emphasizes the needs of private flying. The planners locate the airport sites as near as possible to potential plane owners. Location of highways, railroads, waterways and existing or proposed pattern of airways, major airports and feeder line routes are studied before final choice of the airport site.

Creation of the new section fulfills a program of the CAA in furnishing airport planning assistance. Units have already been set up to compile and furnish information on airport management and design of airport buildings. The three units will supplement CAA activities in surveying the needs of a national airport system and formulating design and construction standards. von Hausswolff, for many years associated with highway, bridge and construction firms, has served as director of the Pennsylvania State Bureau of Parks and until recently was a site planner for the Federal Housing Authority. Smith was formerly a member of the master plan staff, New York City Planning Commission, and on the staff of county planning agencies in the New York City area.

Weather Aids Urged For Personal Planes

The light plane must become a utility, weather notwithstanding, affording more hours of flying than was available in prewar models, if present light plane enthusiasm is to be continued, Frederick H. Smith, flight operations superintendent of the Sperry Gyroscope Company, recently told the National Light Aircraft Meeting of the Institute of the Aeronautical Sciences at their Detroit convention. "In most sections of the United States, the number of flying days available to the light plane owner appears to be almost directly in proportion to the amount of flight instrumentation in the plane," Smith said. Smith, who has 8,600 hours in commercial transports, proposed the Civil Aeronautics Board include another flight-classification in its rules covering conditions in which smoke and haze restrict visibility locally, suggesting these conditions be called "Extended Contact Flight," and a compass-controlled directional gyro, an air speed indicator, an altimeter and a graphic attitude indicator be required. "The laws of aerodynamics and gravity will take no holiday upon the arrival of the Air Age," and light plane manufacturers must use every opportunity to keep the "Sunday airman" out of trouble if they are to retain their market, Smith said.

Embry-Riddle Open for Aircraft Service

Overhaul facilities of Embry-Riddle's aircraft and engine division, which have been devoted exclusively to military operations, have been opened to aviation at large. Facilities for major overhaul of engines, aircraft, propellers, instruments, radio and parachutes are provided, and the company has a special projects department to manufacture special fixtures, tools, etc., for the aircraft and engine division and to conduct research work. This department is also now available to aviation generally. At Chapman Field, Embry-Riddle's landplane base in Miami, the maintenance department under Bruce Hadley, superintendent, will provide periodic inspections, minor repairs and line maintenance for the first time for aircraft other than company or military ships.

R. McLean Stewart Resumes Banking

R. McLean Stewart has resigned as executive director of War Training Service training for the Civil Aeronautics Administration, and resumed his work as vice president of Harriman Ripley and Co., New York investment banking firm.

Bogart to Star in "God Is My Co-Pilot"

The movies are going to film Col. Robert L. Scott's best-seller, "God Is My Co-Pilot." Hedda Hopper, the columnist, said recently it will star Humphrey Bogart.

Simplified Calculator Popular

More than 150,000 units manufactured by the Simplified Flight Calculator Company, of San Antonio, Texas, are being used by Army flight schools, Civil Air Patrol units and preflight students in high schools and colleges, according to John E. Clemons, president. His device, he said, "was created for the simplification of air navigation, particularly as it applies to pilotage. When set to any given sequence, it automatically creates a vector triangle correcting the true heading and ground speed. All dead reckoning problems are solved by visual concept, making it possible to fly a ship and determine time and distance, altitude corrections, etc., with ease and simplicity."

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Final $64 Winner

Here's Cora Mae Briggs of the Lincoln, Nebraska, CAP squadron, who received the final $64 cash award in SOUTHERN FLIGHT's three-month contest for letters recommending postwar continuance of the Civil Air Patrol. All the letters submitted have been sent to National Headquarters.

CAP League to Foster Small Airports, Encourage Aviation in General; Plans and Directors Listed

Thomas H. Beck, chairman of the Civil Air Patrol League, has distributed circulars explaining the League's purposes and general plans. Accompanying the mailing piece was a membership application, bearing the insignia of the organization, and a list of officers, directors and sponsor ($100 annually) members.

Under "purpose", the League listed its major activity as being "to insure support to the Civil Air Patrol in all of its activities. It is the Civil Air Patrol aim to maintain a constant pool of 250,000 cadets." Also stated were: "The League's purpose is to secure a vast membership of American citizens who want to help in maintaining America as the No. 1 nation in the air for all time to come; the League will foster the building of airfields (160 acres) and landing strips in towns throughout the country as enduring memorials to those who served and saved the nation in this war; the League will encourage private, commercial and cargo flying, and the study of aeronautics, meteorology, navigation, aircraft maintenance, radio communication; the League will promote the general welfare of the nation's youth, and encourage it to better health and citizenship."

Under "plan", the circular stated: "The League will function on the basis of local community units—similar to the organization of the well known national civic groups; nine Civil Air Patrol League vice presidents in the nine areas will serve in a liaison capacity with the national offices; all officers, other than a general manager and small office staff at New York headquarters, will serve without pay; the sole source of revenue will come from individual membership dues—contributions, either from public, private or governmental sources, are prohibited by the League by-laws; any American citizen, male or female, may become a member; a membership card and a CAPL insignia will be furnished each member upon payment of dues in advance; a periodic bulletin for members will be published (no advertising space for sale); the League's national medical advisor and the three national chaplains (Protestant, Catholic and Jewish) will advise and confer on matters pertaining to the health and welfare of the youth of America (in one area recently, out of 814 candidates seventeen years of age, only 104 passed the physical examination).

Officers and directors, in addition to Chairman Beck and President Frank A. Tichenor, were listed as follows (all are business executives or prominent leaders): Vice Presidents—Francis S. Murphy, Hartford Times; Bromwell Ault, Interchemical Corp.; Mrs. Arlene Davis, Cleveland, Ohio, and Harry K. Coffey, Portland, Ore. Treasurer—Sidney Lanier, J. P. Morgan & Co., Inc. Directors—Dr. Edwin H. Armstrong, New York City; E. J. Engel, Atchison, Topeka and Santa Fe Railway System; William R. Enyart, Simmonds Aerocessories, Inc.; Henry Ford, II; William Green, American Federation of Labor; Theron M. Hall, National Exchange Club; Walter W. Head, Boy Scouts of America; Palmer Hoyt, Portland Oregonian; Henry J. Kaiser; Judge Camille Kelley, Memphis, Tenn.; C. F. Kettering, General Motors Corp.; Mrs. Alan H. Means, Girl Scouts of America; Dr. Frederick W. Minty, Rapid City, S. D.; Charles E. Moore, Sunnyvale, Calif.; Philip Murray, CIO; Phillips M. Payson, Portland, Me.; Roy A. Roberts, Kansas City Star; Mrs. Ruth Bryan Owen Rhode, Alderson, W. Va.; William B. Stout, Consolidated Vultee Aircraft Corp.; Niles Trammell, NBC; Harry M. Warner, Warner Bros., Pictures; Dr. Helen C. White, American Association of University Women; Mrs. John L. Whitehurst, General Federation of Women's Clubs. National chaplains are Monsignor Philip J. Furlong, New York; Rabbi Louis Binstock, Chicago, and a West Coast Protestant clergyman, suggested by the Federal Council of Churches but as yet unnamed. Joseph C. Horan, M. D., assistant medical director of the Metropolitan Life Insurance Co., is chief medical advisor, and the auditors are Deloitte, Plender, Griffiths & Co., New York.

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—(Air Service Command Photo.)

UTAH WING AND CADET UNIT members from five squadrons, totalling 180 persons, initiated a series of summer junkets recently by visiting the Air Service Command at Hill Field. The Cadets were privileged to sit at the controls of B-24 bombers, many of the Liberators returned only recently from bombing missions against the enemy. Wing Commander Joe Bergin worked out details with Captain A. B. Wanamaker, ASC public relations officer at Ogden.

CAP Aids Thousands in Midwestern Floods

The value of trained Civil Air Patrol pilots and ground personnel in time of disaster was proved again recently when the Missouri Wing and units in nearby states rendered thousands of hours of service in directing rescue, evacuation, reconnaissance, supply and other activities during Midwestern floods. Thousands of families were made homeless and the CAP units, beside working on their own, contributed greatly to efforts of the Red Cross, Coast Guard, state guard, Army and other agencies.

Kansas City squadrons were first alerted by the U. S. Engineers. They carried on despite a severe hail storm which damaged nine CAP planes. St. Louis and Columbia units were unusually active. Although it is impossible to cite the work of each individual, the following CAP personnel was selected at random for special mention: Capt. Harry L. Hall and Lt. Gene Burnett, who alerted Kansas City area pilots and submitted first flood reports to Wing Headquarters; R. L. Musser for his daily aerial reports from Columbia; Maj. L. W. Greene and Lt. J. D. Nelson for patrolling from K. C. to St. Louis in adverse weather; Lt. Glenn Mitchell, who flew high Army officers on vital missions; Capt. Jack Geders for directing all flight operations and flying some of them himself; Lt. James Irwin and Lt. Denny Nelson for liaison with relief agencies; Capt. H. F. Rowland, Capt. Walter W. Smith and Lt. James Irwin for flying military, Red Cross, U. S. Engineers, Coast Guard, state guard, newsreel and magazine photographers; Pilots Monnig and Drake for flying tough assignments; Lt. Sid Rosen, former Coastal Patrol pilot, who probably flew longest hours of all; and Marie Umfleet of Cape Giradeau, who (we are told) rented planes at her personal expense and operated them frequently at the request of the U. S. Engineers and the Coast Guard.

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By TONY HAGMANN

After Texas Aviation Week, aviation exhibits, conferences, dinners with speeches, breakfasts with HO's, dances with Latin Americans, etc., we feel like a tree full of owls—wet owls to be sure, very wet owls. It rained the whole time.

Some of the crowd waded over to our booth and signed the register. Names making news include "Pop" Cleveland and Pete Chamberlain, of the Cleveland Pneumatic Tool Company; Gail and Glenn Stearman with test pilot Marvin Dulick, Enid, Oklahoma; Carolyn Cassidy, Miss American Aviation, Louisville, Kentucky; Steadham Acker, Exposition Director, Birmingham; Ben Tobin, Jr., Continental Motors, Dallas; R. E. Evans, Aero Products Division, GMC, Dayton, and test pilot Jimmie Mattern, Lockheed, Burbank. At Southwest Airmotive Company's booth, we captured W. J. Rychly; Thomas B. Taft, B. G. Corporation; C. G. Killingsworth; E. Guthrie and R. Barns with Ranger Aircraft; Julian Freeman, Shell Oil, Atlanta; and L. K. Bolinger, Bendix Products Division, South Bend, Indiana. Houstonites included: Ellis Gotcher; H. D. Smith, Precision Aeromotive Corporation; Earl McKaughn, Aviation Enterprises; Lee Meyer; Adolph A. Pfeffer; Jack Shannon with Humble and Shorty Walker, Walker Baumann Propeller Service. From Fort Worth: C. O'Niel, CAA; Roy and Ruth Taylor; Les Bowman, William Fate; E. D. McCarter and Jim Wall, with Aircraft Sales Co. and G. Sinclair, CAA.

Knee deep in the heart of muddy Texas water were: Kay Olesen, McQuay, Inc., Minneapolis; Harry Moyer, Ballard Aircraft, New York and Dallas; Ed Nilson, Wichita; Walter Beech, Beech Aircraft, Wichita; "Moe" Morard, Aircraft Steel and Supply, Wichita; Al Bennett and R. L. Davison of Aeronca, Middleton, Ohio; Dick Bomberger, Sensensich Bros., Lancaster, Pa.; Ole Fahlin, Fahlin Manufacturing Co., Columbia, Mo.; Lee Seattele and John Lucas, Jacob Aircraft Engines, Pottstown, Pa.; R. B. Row and J. Corrigan, Boeing, Seattle; B. Larkin, F. A. McAllister and K. E. Van Scoy, Butler Mfg. Co., Kansas City.

From Camp Livingston, La., came five Grasshopper planes complete with pilots. Three of them, Lt. R. E. Hopkins, Lt. Lortz and Corporal Dixon, gave us the dope on the Dallas Wolves they have painted on the side of said Grasshoppers. Very high grade.

Margaret Keogh, CAA, packed away a cold hot dog with us, washed down by a hot coke. We watched Curtis Duty, Hargett Electric, Dallas, set up a "something", wandered over to see the captured equipment, in charge of Lt. Damon Elder, AAF, Materiel Command, Wright Field, and listened to the Navy band. Then we put our best finger print on the shiny Ercoupe . . . felt of the Jacobs Engine Company's orchid to see if it were real (it was), admired everybody's exhibit, heard two new jokes and stared at all the "Si Si" uniforms from the "Si Si" countries. Eighteen Latin American pilots came, saw and were enchanted.

Roy B. Clymer, Romec Pump Co., worried with us over the mired jeep . . . Freddy Bartholomew and Major D. J. Perry came with L. D. Catlin from Oke City to view the latest, Bob Morrison, Collier's; Al Bennett, Aeronca; Bob Spradlin, personal pilot, dug the jeep out of the mud for us . . . and blotted us up from two inches of rain on the head. Air Associates had such a realistic model in a flying suit that we spoke at least nine times before we came to with that silly red-faced grin from hear-to-hear, and quit speaking. Simplified Flight Calculator Company gave out with a system for figuring out how to get where you're going, which got every pilot's rapt attention and made us jealous. There was a great deal of "oh" and "ah"ing over the new Stearman propeller and low winged plane, and the Guiberson Diesel Engine, on our left and right . . . and one Texas Prefabricated hangar outside the tent.

Of course there were plenty of headaches to be had for the asking and if anybody had one it would have to have been . . . Steadham Acker; Wilson Germany; George Jalonick; Queenieve Butler; George Haddaway; M. Ravinovitch; M. Garavito; John Williams; Ben Critz; B. F. McLain or anyone else on

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Major W. F. Long, Pres.

the committee. And we mean from plain hard work. They did one year's work in less than six weeks.

Right about this time we are sure we have left out somebody who belongs in, but for the life of us, who?

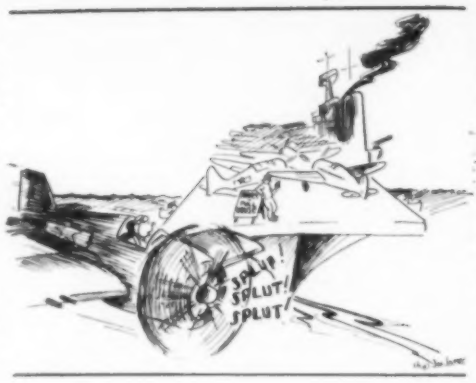
Monday . . . we swam down to College Station for three days where there was a fierce lot of gum beating over every phase of aviation. The Aviation Writers arrived after a fifteen-hour cruise in a hot Navy bus, equipped with a 35 mph governor.

Mr. and Mrs. Cardwell, who operate the airport in Bryan, received a honey of a compliment from W. N. Peacock of Dallas. He said: "For real hospitality, I vote for them." He was referring to the way they get folks back and forth to town . . . real easy.

All the meetings we attended with Sandal Dailey, Dallas Morning News, were on non-scheduled aviation, except one CAP meeting, where Tom Beck discussed the CAP League.

Many ideas were exchanged . . . much was asked of the manufacturers. E. H. Cargen, Jr., asked why not a roadable airplane; Earl McKaughn suggested lights to indicate safety or trouble on the panel; Bill Piper was asked for a new plane . . . he said not to look for anything startling . . . Roscoe Turner said to use horse sense in aviation . . . John Wilson gave out on the gasoline situation . . . Major Buck Steers told of Michigan's progress in getting airports. The how and how about. The phrase of "Area Airlines" was suggested in lieu of "Feeder Airlines" . . . "personal pilot", instead of "private pilot", "air parks" instead of "air strips" . . . and everybody got a lot off their chest for the good of aviation.

Kansas City, Missouri . . . Marion Melcher reports that instruments of a full-sized glider



will be part of the ground trainer airplane glider which is being constructed by the aviation training students at East high school. While the glider will never take the air—it serves a definite teaching purpose. . . . North American dusted off a huge welcome mat and invited the public to observe a considerable portion of their construction work. Capacity crowds poured through the plant on April 13th and 14th . . . Each day there is news of new air stops, all of which brings the trade territory closer to our city . . . Flying visitors included Senator Clyde M. Reed and Robert P. Patterson of Washington . . . Cy Willock was among those attending the Aviation Conference in Texas the fore part of May and came back with Tony Hagmann's "Hello" . . . The CAA continues to sell planes . . . And the Kansas City Unit of the Women's National Aeronautical Association completed another whirlwind project, this time furnishing the Ready Room for the WASP. Miss Helen Richey is squadron leader of the group stationed at the Ferry Command base on Fairfax airport. A bare room was transformed into a comfortable "Wasp Nest" in less than a week's time. To show their appreciation the WASP held open house for the WNAA and other donors on the evening of May 15th. Miss Francie Meisner, a member of the WNAA, leaves for Sweetwater training on May 26th; another former member, Miss Jane Emerson, is a WASP and stationed at Love Field.

Flights Awarded Students

Southern Airways, Inc., recently awarded the outstanding students in preflight aeronautics courses in Birmingham and Jefferson County (Alabama) high schools a flight to an Army primary training school operated by Southern Airways in Decatur, Ala. Frank W. Hulse, president of Southern Airways, last fall offered the award to the students doing the best work during the year in preflight aeronautics in order to stimulate interest in the courses and as a contribution to the Education for the Air Age program in the Alabama schools. W. M. Grissom, director of flight for Southern Airways, led the flight to the training school where the winners were entertained and flown back to Birmingham. The students winning the award were Richard Whitman, J. D. Kisber, Ed Gilder, Mervin Norton, Wilson Bass and Bernard Paxton in the city high schools, and Robert Eugene Tate, Elizabeth Mae Scudder, Lamar Adcock, Herschell Peterson, John Goodloe, Trueman Pledger, Edward Hill and Charles Dickey in the county high schools.

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